Look for Us!

PUBLIC
DEC 31 1942

COAL AGE

DECEMBER 1942

McGRAW-HILL PUBLISHING COMPANY, INC.

Price 35 Cents

Loader "Leaves" CANCELLED for 18 MONTHS!

SUN MINE LUBRICANTS

Kept Loader "On Duty" 12 Times as Long . . . . . Reduced Gear Replacements 92%

A large Pennsylvania coal mine had experienced difficulty in keeping a loader on the job. Every six weeks it was necessary to overhaul or replace gears. Then, acting on the advice of a Sun Oil Engineer, they switched to SOLNUS Heavy Medium Oil for gear lubrication.

The results have been spectacular. Gear overhauls have been reduced 92%. Only one replacement has been required in a year and a half of continuous operation.

This is typical of the job that Sun Doctors of Industry and Sun Mine Lubricants are doing to keep mine equipment operating at peak efficiency, with minimum time-out and expense for maintenance. In these days, when maximum coal production is so vital to America . . . when equipment and parts must *last* . . . it will pay you to call in a Sun Engineer. For further evidence of the job he can do, write for a copy of our booklet: "Helping Industry Help America."

SUN OIL COMPANY—Philadelphia

Sponsors of the Sunoco News Voice of the Air—Lowell Thomas

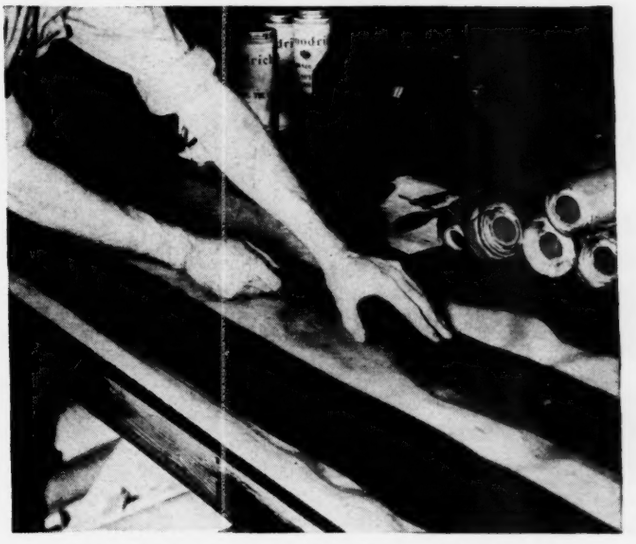
BUY WAR BONDS AND STAMPS

SUNOCO

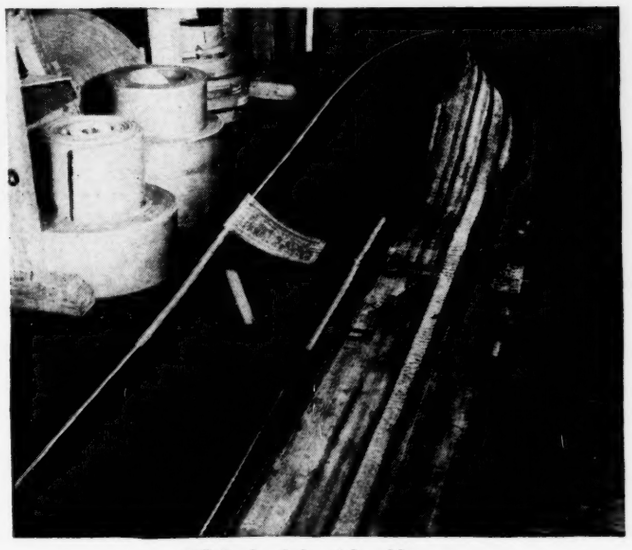
SUN PETROLEUM PRODUCTS.. HELPING INDUSTRY HELP AMERICA

Here's how others are conserving rubber

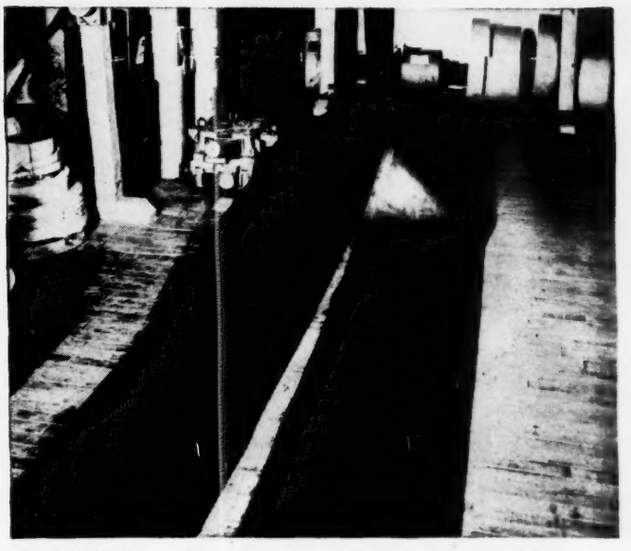
Trimming edges on a 6" feeder belt preparatory to putting on new rubber.



Same belt after it has been repaired. Good for many months additional service.



20" feeder belt with rubber removed from damaged places.



Same belt after it has been repaired. (To replace this belt with a new one would needlessly have consumed 200 pounds of rubber.)

Conveyor belts can have 9 lives

Another B. F. Goodrich suggestion to save rubber

LIKE the proverbial cat that has 9 lives, old, worn conveyor belts (and even belts that have been discarded) are proving they have additional lives —many are being revived for months of use that owners never expected.

It's being done by the B. F. Goodrich repair method — worn parts are cut away, repair sections are fitted in and vulcanized in place by a portable vulcanizer. Cuts, gouges, tears, breaks and worn edges can be repaired in this way. Belts worn to the point of danger can be made safe, many belts already discarded can be put back into service, and tons of rubber can be conserved.

If you have any old conveyor belts that need repairs or that have been discarded, see your B. F. Goodrich distributor or write us for his address. Most distributors are trained and equipped to make belt repairs right in your plant. And they can show you how to save rubber in many ways, by proper care and maintenance of all your industrial rubber products. Write us, too, for a free set of folders on conservation of rubber products and, if you use conveyor belts, for the B. F. Goodrich Belt Conservation Manual. *The B. F. Goodrich Co., Industrial Products Division, Akron, O.*

B.F. Goodrich

FIRST IN RUBBER

AMERICAN

Let the bells ring louder this Christmas! Let them ring out the fears and frustrations of an old year. Let them ring in for you the Season's best wishes and —a Victorious New Year.

HULBURT OIL & GREASE COMPANY

Specialists in Coal Mine Lubrication

PHILADELPHIA . . . PENNSYLVANIA

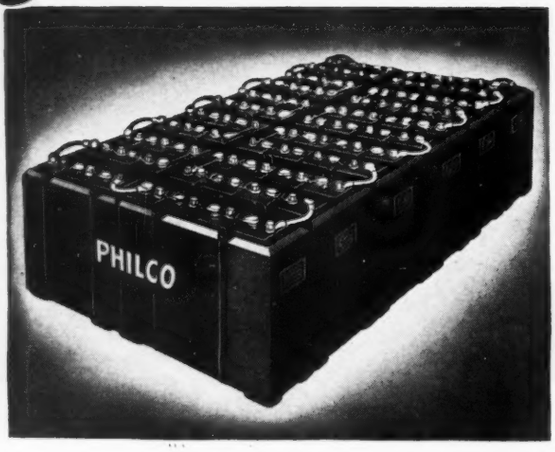
HULBURT

CHRISTMAS

QUALITY GREASE

NOW... LOCAL SERVICE ON PHILCO BATTERIES

In every important industrial center from coast to coast, there's a Philco Battery Sales Agent ready to give you the help you need!



TODAY, when fast service and fast deliveries are at a special premium, Philco is better equipped to serve you than ever before! In the 113 cities listed below there's a Philco Battery Sales Agent "right around the corner"! And thanks to Philco's huge new plant, you can now get far better than average deliveries on Philco Batteries! Write today for a new Philco catalog and the name of your Philco representative.

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STORAGE BATTERY DIVISION
TRENTON, NEW JERSEY

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Wilmington

DISTRICT OF COLUMBIA:
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FLORIDA:
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Miami
Pensacola
Tampa

GEORGIA:
Albany
Atlanta
Savannah

IDAHO:
Boise

ILLINOIS:
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Decatur
Peoria
Quincy
Rock Island

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New York
Plattsburg
Rochester
Syracuse

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Fayetteville
Wilmington
Winston-Salem

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Minot

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Cincinnati
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El Paso
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Houston
San Antonio

UTAH:
Salt Lake City

VERMONT:
Burlington

VIRGINIA:
Danville
Richmond

WASHINGTON:
Seattle
Spokane

WEST VIRGINIA:
Bluefield
Clarksburg
Huntington

WISCONSIN:
Milwaukee

WYOMING:
Casper

FOR FAST INDUSTRIAL BATTERY SERVICE, CALL YOUR PHILCO SALES AGENT!

CONTENTS

VOLUME 47 DECEMBER, 1942 NUMBER 12

Loader and 14 Cars Get Output at Greenbrier Mine. 60

Auxiliary Pump Insures Certain, Efficient Operation. 63
By H. F. BRECKER

Aerial Tramway Transportation Link at Pond Creek. 65
By J. H. DICKERSON

Armature Progress Reflected in Long-Term Records. 67

Output per Man-Shift Rises With Seam Thickness.. 69

Right Safety Outlook Essential in Coal Mining..... 71

New Men Throw Extra Burden on Safety Staff..... 73
By EUGENE McAULIFFE

Plant Defense Handled by Special L. N. C. Group... 74
By H. S. GILBERTSON

War-Time Safety Highlights the Supervisors' Role. 78
By WILLIAM MURPHY and ROY R. NEWHOUSE

Explosives and Haulage Discussed by Safety Group. 84

Absenteeism and Accidents Discussed at Ebensburg. 114

Problems of the Day Occupy Illinois Institute Men.. 128

Editorials 55
Foremen's Forum 95
Questions and Answers..... 97
Manufacturers' Tips 100
Operating Ideas 109
News From the Field.....57, 113

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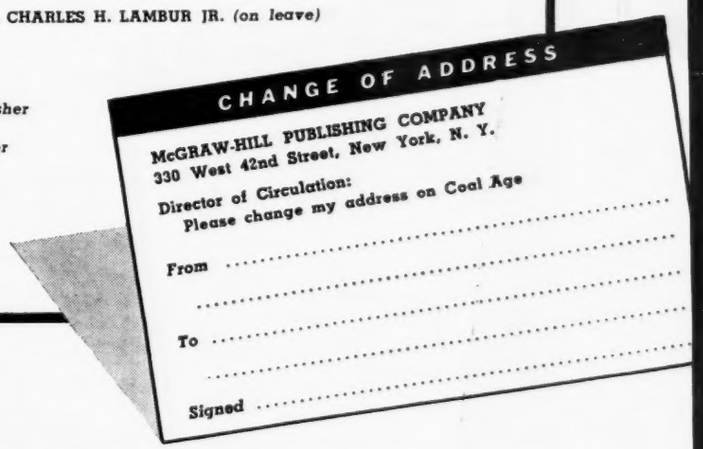


PROGRAM NOTES—COMING ATTRACTIONS

• SAFETY is not like the weather, which Mark Twain is reputed to have described as something everybody discusses but nobody does anything about. Things can be done about safety, as improvements in the record for coal mining have shown in recent years, although it must be admitted that even further progress probably should have been made. War, however, is making the problem more difficult in various ways, including breaking down the mental attitude so necessary for safe working and throwing on the industry an added burden in breaking in the training new men to take the places of those lost.

• The solution seems to be one of increasing pressure on safety work and careful training of new men. Where this is done, as Eugene McAuliffe points out in the special safety section included in this issue (pp. 71-94), safety gains can be held and even improved. A quick look at the fatality record in both the anthracite and bituminous industries and analyses of the effect of war conditions on safety progress and what should be done to maintain and improve the industry's record, by representative coal-mine

A whole year's tips on a handy tag...
TO GO WHERE IT'S NEEDED MOST

HOW TO MAKE WIRE ROPE LAST

INSTALL PROPERLY

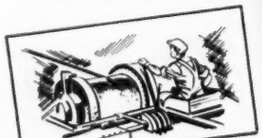
Avoid kinks by proper unreeling and uncoiling:

Mount reel on jacks or substantial cribbing.

Roll coil along floor.

SPOOL CORRECTLY THE FIRST TIME:

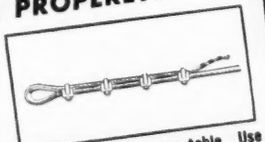
Wind all wraps on tight.
Make each turn fit snug.
Do not interlock strands.



PUT CLIPS ON PROPERLY:

NUMBER OF CLIPS REQUIRED FOR "BLUE CENTER" STEEL WIRE ROPES

Rope Diameter	Number of Clips	Spacing of Clips	Length of Wrench
½" to ⅝"	4	3½" to 4¼"	12"
¾" to ⅞"	5	5" to 5¾"	18"
1" to 1⅛"	6	6½" to 7¼"	24"
1¼" to 1⅜"	7	8" to 8¾"	24"
1½"	8	9½"	24"



Use enough clips—see table. Use a wire-rope thimble. Put U-Bolts on dead end of rope. Retighten clips after running one hour.

ALL THROUGH 1942, our advertising has brought you much valuable information on how to install wire rope, how to maintain and inspect it, how, in brief, to make it last as long as possible.

Many of you executives and operating men have expressed a desire to pass along this information in simple, handy form to your men who really handle the rope, so they'll be able to use it right on the job.

Here they are—a whole year's tips on wire-rope conservation—on a sturdy, convenient tag you can have fastened right to equipment, on controls, or to the wire rope itself.

Printed on heavy stock and varnished for further protection, the tags are ideal for use right on the job—durable, washable, always legible. And they're yours for the asking! *WRITE FOR "TAG A".*

JOHN A. ROEBLING'S SONS COMPANY
TRENTON, NEW JERSEY
Branches and Warehouses in Principal Cities

★ PROMPT SERVICE
★ on essential orders
★ from warehouse
★ stocks or mill

ROEBLING
"Blue Center"
STEEL WIRE ROPE
PREFORMED OR NON-PREFORMED

supervisory officials, are other features in this safety section.

• Plant protection against spying and sabotage is another duty imposed on industry and coal mining by war. Some work has been done. More undoubtedly could be done. How one organization, the Lehigh Navigation Coal Co., has handled the job therefore is the subject of an article by H. S. Gilbertson, also included in the safety section (p. 74).

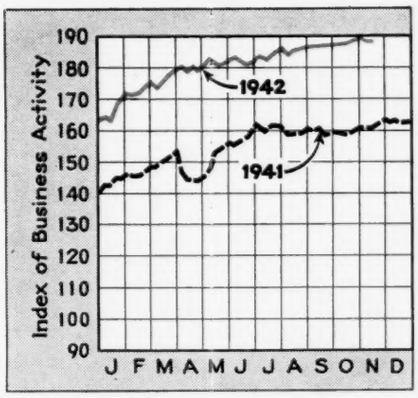
• Mechanical mining, in this case at a truck operation, leads off the regular fare in this issue. One loader and 14 mine cars enable the Greenbrier Smokeless Coal Co. to produce over 10,000 tons a month. How it does it and how it handles crushing with an unusual bin and roll setup is described in the article beginning on p. 60. Handy for comparison, also, is the check chart showing output per man-shift at West Virginia mechanical mines, which is the pièce de résistance of the article starting on p. 69.

• Solving a pumping problem by installing an auxiliary unit to feed the water to the main pump and thus attain a number of desirable objectives is described by H. F. Brecker (p. 63). J. H. Dickerson explains the advantages in installing an aerial tramway as a transportation link in serving two new mines in the Williamson field (p. 65). How detailed records have demonstrated progress in armature design and maintenance at Zeigler No. 1 mine, Bell & Zoller Coal & Mining Co., is recounted in the article on p. 67.

• Operating, preparation and other articles on the fire for the future include a story on how a new-type higher efficiency dust-separating method made practicable the air-cleaning of high-ash fines at the Wayland (Ky.) plant of the Elk Horn Coal Corp. Mining with shaker conveyors and duckbills in southern West Virginia is another feature on the schedule, along with stripping and preparation developments at an Illinois property.

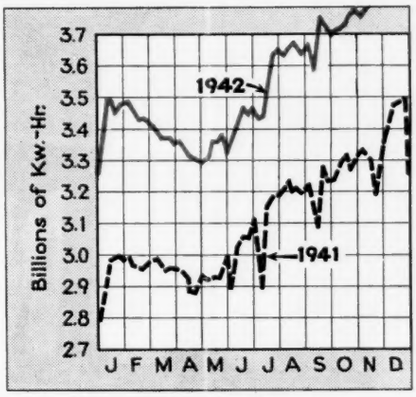
• Hoisting and pumping also appear on the agenda for coming issues, which will feature, in addition, training men, operation of victory production committees, safety and other management and personnel problems. Maintenance also bulks large in the program for the future, with articles on shop and underground methods at various properties, including metallizing applications, and the care and recovery of materials.

HOW'S BUSINESS



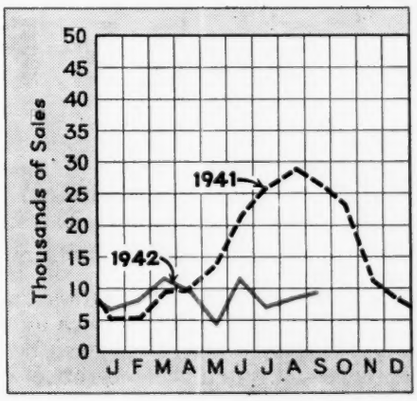
GENERAL BUSINESS CONDITIONS

Hand in hand with gratifying war news readjustment of civilian economy continues and the war production is really coming into its own, *Business Week* points out. As the year end approaches, output peaks are in sight. Metal-capacity expansion programs are due for completion by mid-1943. By that time the "controlled materials plan" is expected to have accomplished its goal of making the most materials in terms of end-products. The *Business Week* Index reached 188.2 for the week ending Nov. 14, compared with 187.7 a month earlier and 161.2 a year previous.



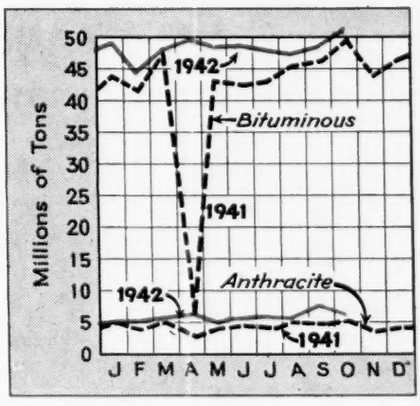
ELECTRIC POWER OUTPUT

Production of electric energy by the electric light and power industry during the week ended Nov. 14 registered a more than seasonal rise as the slight decline of the preceding week was arrested, according to figures by the Edison Electric Institute. Output during the week ended Nov. 14 was 3,775,878,000 kw-hr., compared with 3,761,961,000 in the preceding week, the latest week representing a 12.8 percent increase over the corresponding week a year ago. Output for other recent weeks was: Oct. 24, 3,752,000,000 kw.-hr.; Oct. 31, 3,774,891,000 kw.-hr.



COAL STOKER SALES

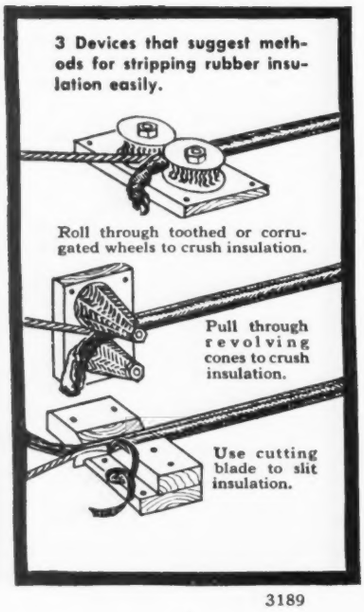
Sales of mechanical coal stokers in the United States in September last totaled 9,057 units (U. S. Bureau of the Census from 93 manufacturers, only 58 of whom reported stoker sales during the month), compared with 8,350 in the preceding month and 27,138 in September, 1941. Sales of small units in September last were: Class 1 (under 61 lb. of coal per hour), 7,898, (bituminous, 6,725; anthracite, 1,173); Class 2 (61-100 lb. per hour), 298, (bituminous, 256; anthracite, 42); Class 3 (101-300 lb. per hour), 488.



COAL PRODUCTION

Bituminous coal produced by United States mines in October last (preliminary) totaled 51,065,000 net tons, according to the Bituminous Coal Division, U. S. Department of the Interior. This compares with an output of 48,760,000 tons in the preceding month and 51,328,000 tons in October, 1941. Anthracite tonnage in October last, according to the U. S. Bureau of Mines (preliminary), was 5,101,000, as against 5,426,000 (revised) in the preceding month and 5,580,000 tons in October, 1941.

that Rubber Scrap is Priceless!


3 Devices that suggest methods for stripping rubber insulation easily.
Roll through toothed or corrugated wheels to crush insulation.
Pull through revolving cones to crush insulation.
Use cutting blade to slit insulation.

3189

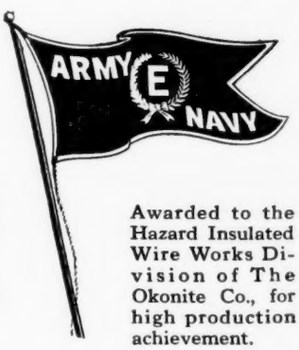
The rubber insulation of wire and cable is even more valuable today than the copper conductor, scarce as copper is! Saving vital copper is absolutely necessary, of course, but the rubber in wire and cable insulation is priceless. The rubber shortage is so acute that immediate corrective measures in both military and civilian life have become necessary. So get into the scrap and salvage both copper *and* rubber.

Hazard cords, cables and insulations have extra years of service built into them. Get these extra years of service by using every precaution for their protection and longevity. But, if they can no longer be used, *strip* off the rubber insulation and sell it to a licensed rubber dealer and sell the copper conductor to a metal dealer.

The scrap you save here and now may later become the difference between victory and defeat on some far-flung battlefield.

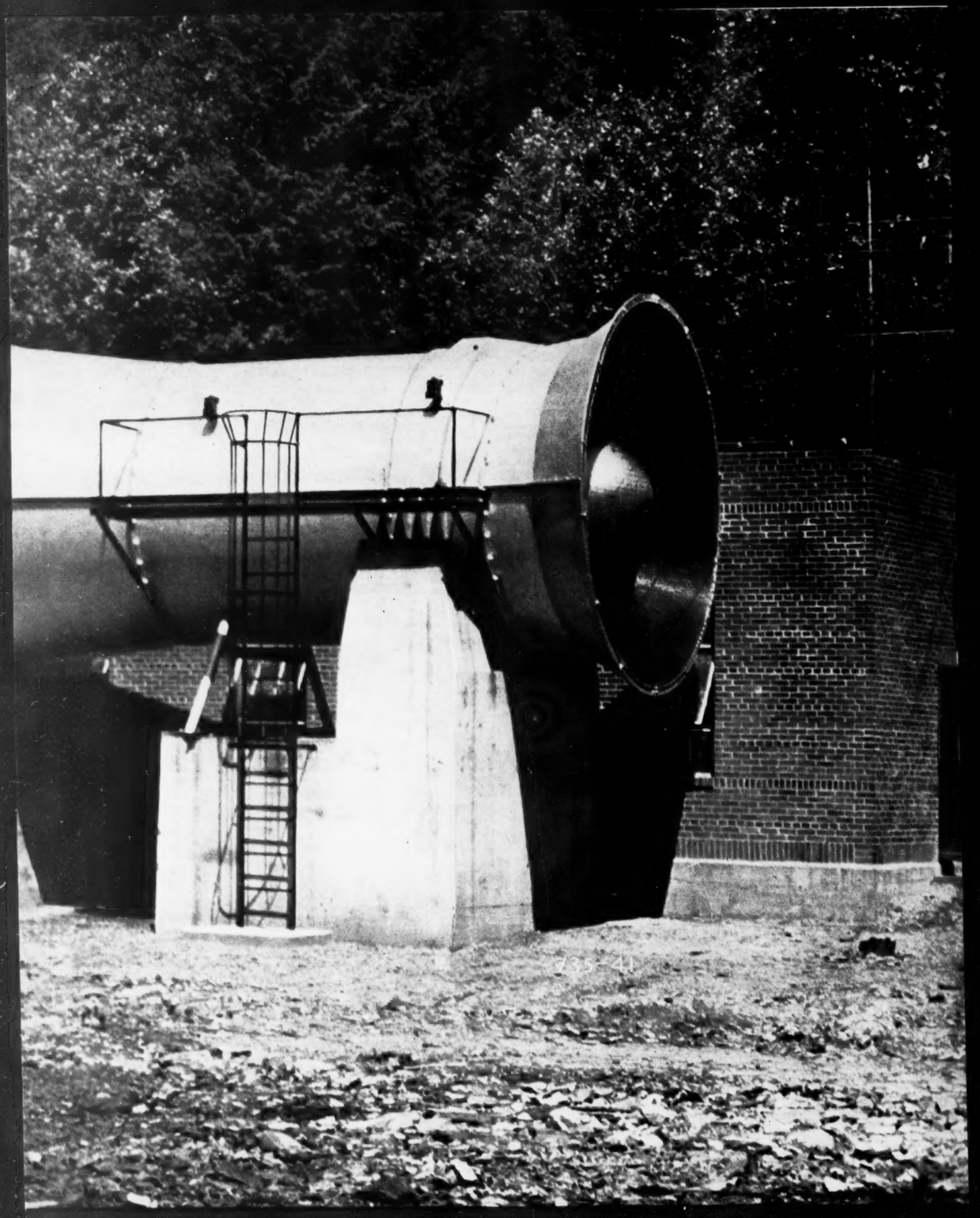
HAZARD INSULATED WIRE WORKS
DIVISION OF THE OKONITE COMPANY
Wilkes-Barre, Pennsylvania
Offices in Principal Cities

HAZARD
INSULATED WIRES & CABLES
Salvage Your Scrap – Buy U. S. War Bonds



Awarded to the Hazard Insulated Wire Works Division of The Okonite Co., for high production achievement.

THE Wind Giant



JEFFREY AERODYNE

JEFFREY
EQUIPMENT for MECHANIZED MINING

CUTTERS
DRILLS
LOADERS
CONVEYORS
LOCOMOTIVES
FANS
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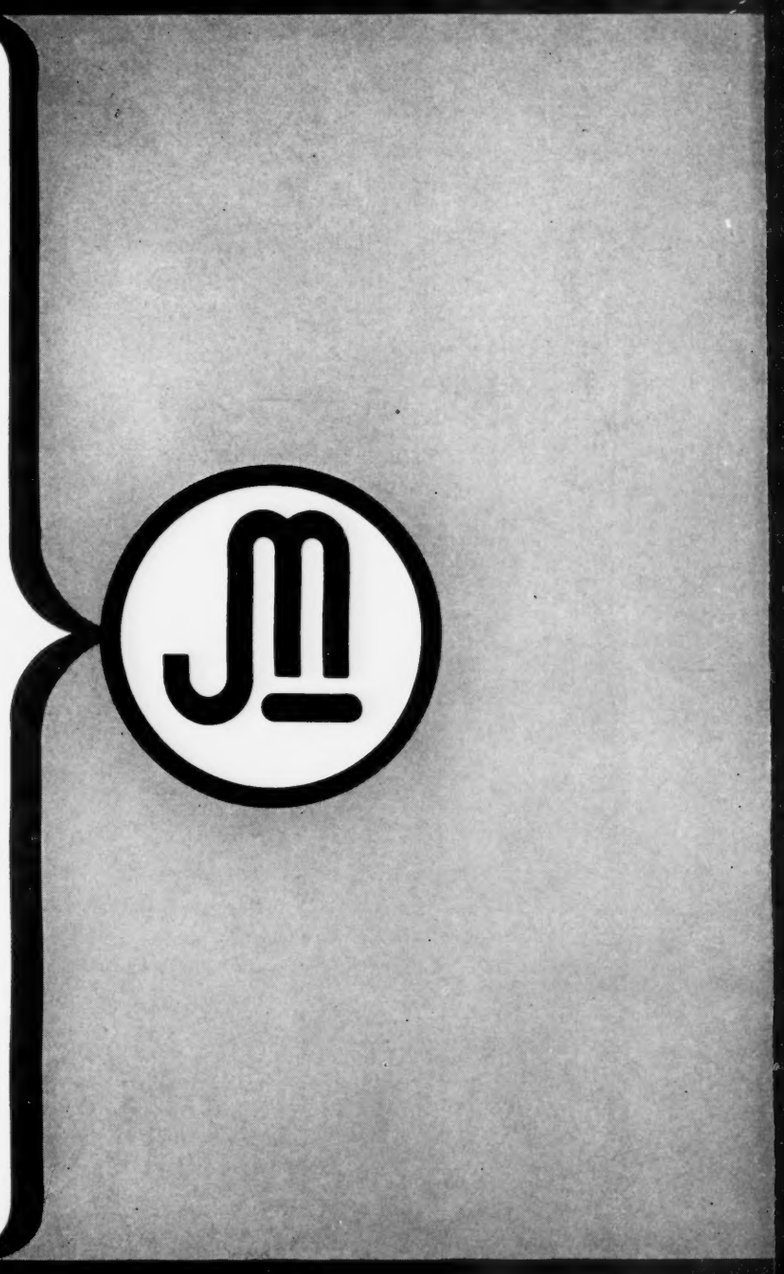
JIGS
CRUSHERS
SCREENS
RENEWAL PARTS



BELOW AND ABOVE GROUND
FROM FACE TO RAILROAD CAR

MAINTENANCE HINTS FOR PROPELLER FANS

● To get dependable and maximum efficiency from your mine fans, we offer these helpful suggestions:

BEARINGS

Follow factory lubrication recommendations carefully.
Observe oil level in reservoir daily.
Flush out bearings once every six months.
Keep all bolts tight.

DRIVE

If belt driven, proper belt tension increases belt life and bearing life of both fan and motor.

Inspect the drive regularly—follow factory instructions which accompany each fan.

PAINTING

Keep exposed parts well painted with corrosive-resisting paint at all times.

BLADES AND VANES

Clean fan blades and straightener vanes once a year. This preserves highest operating efficiency and dynamic balance of rotor.

Keep blade adjustment in step with the mine. Measure fan speed and pressure carefully. Refer to Jeffrey fan performance curves for guidance. The primary purpose of adjustable blade feature is to maintain high fan efficiency in the face of ever-changing mine development.

Blade adjustment is simple — requires neither the use of gauges nor factory assistance — can be performed by any mine mechanic equipped with an Allen wrench.

THE JEFFREY MANUFACTURING COMPANY
912-99 North Fourth Street, Columbus, Ohio

Sales Offices: Baltimore, Birmingham, Boston, Buffalo, Chicago, Cleveland, Cincinnati, Detroit, Denver, Harlan, Houston, Huntington, Milwaukee, New York, Philadelphia, Pittsburgh, Scranton, St. Louis, Salt Lake City

Service Stations: Pittsburgh, Harlan, Ky., Birmingham, St. Louis, Logan-Beckley, W. Va., Scranton

Mining "Bullets" with every Ton!...

WITH adequate priorities for essential mines again indicated in current WPB planning, we welcome signs that government agencies, labor leaders and mine managements are getting coordinated nationally through Labor-Management Committees to further arouse the mine worker to the vital importance of doing the best job for the war effort *right where he is every work day.*

Victory production at every war plant *starts* at the mines. That makes the mine worker literally "America's FIRST Soldier on the Home Front". But *he* has to know it too!

The American way of life has taught us that education is better than compulsion in working together as free men. It follows that happier mine workers, less migration to other war industries, unnecessary absenteeism and maximum daily output from *each worker and the machines entrusted to his care* will inevitably follow his glowing realization that he is literally America's first answer to victory production—and to the better life we all want for our children when this war-torn world is rebuilt.

So mine by mine let's "sell" this concept of his hard day's work—to every mine worker, to his family, to the other war industries that have been raiding mine labor and thus imperiling their own war production jobs at the source of their own raw materials, and to the public-at-large which is still all too ignorant of the Miracle of Production being performed in this war by the *Fighting Men behind modern mining.*

P. S. We see WPB has released vacuum cleaners from "frozen stocks." Now how about some refrigerators and other household appliances for equipping the miner's family for better war work and to improve living standards otherwise inaccessible in most isolated mining camps?

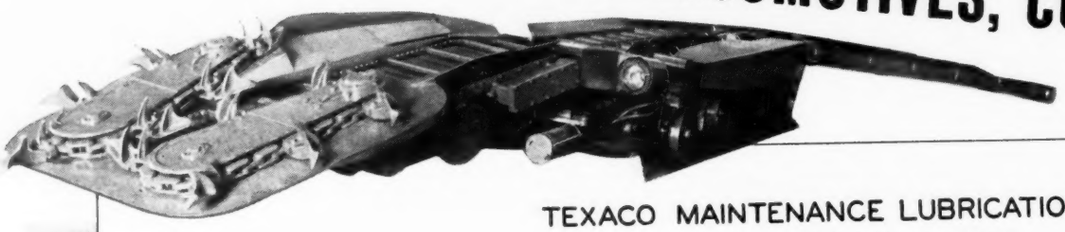
PUBLISHER

★ ★ ★ ★ ★ ★ ★ ★ ★

COAL VITAL to VICTORY!

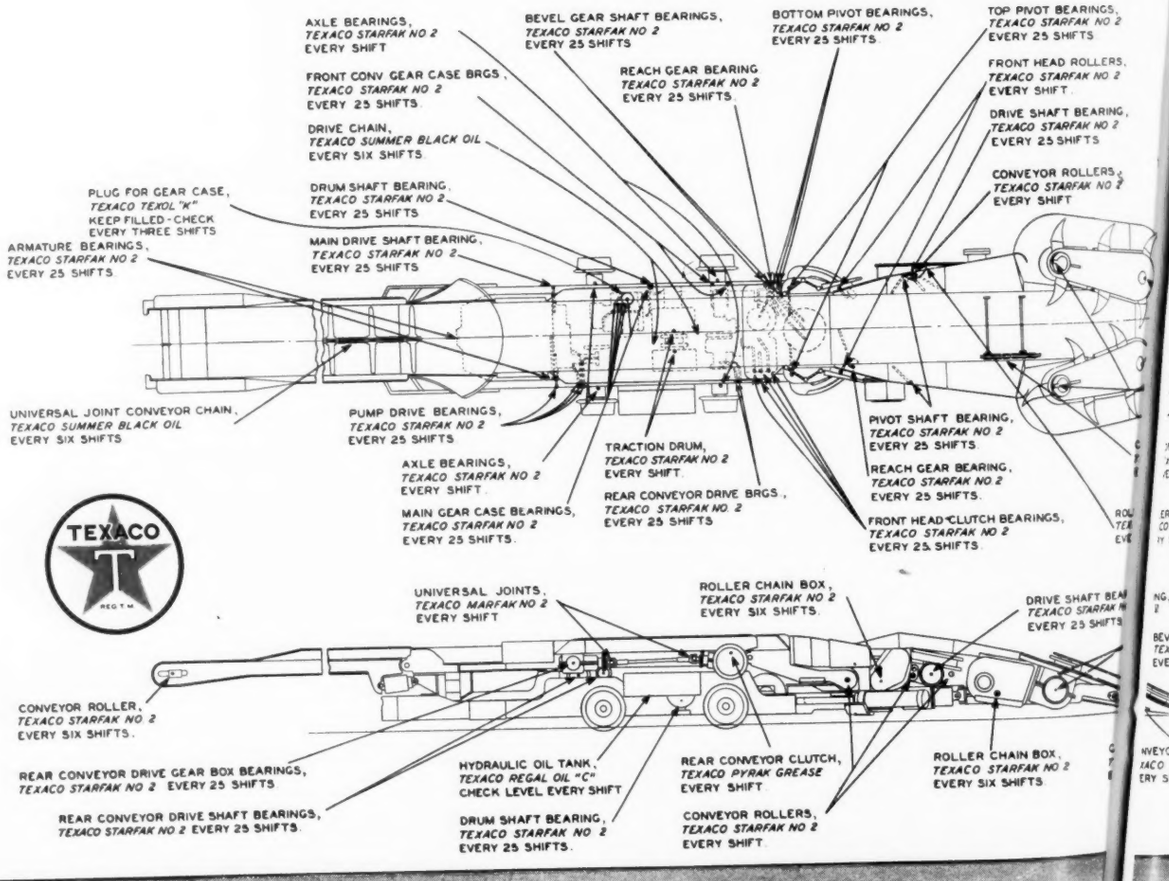
War-time BEGINS WITH

YOUR LOCOMOTIVES, CUTTERS,



TEXACO MAINTENANCE LUBRICATION CHART

CLARKSON COAL LOADER


AXLE BEARINGS, TEXACO STARFAK NO 2 EVERY SHIFT
BEVEL GEAR SHAFT BEARINGS, TEXACO STARFAK NO 2 EVERY 25 SHIFTS
BOTTOM PIVOT BEARINGS, TEXACO STARFAK NO 2 EVERY 25 SHIFTS
TOP PIVOT BEARINGS, TEXACO STARFAK NO 2 EVERY 25 SHIFTS
FRONT CONV GEAR CASE BRGS., TEXACO STARFAK NO 2 EVERY 25 SHIFTS
REACH GEAR BEARING TEXACO STARFAK NO 2 EVERY 25 SHIFTS
FRONT HEAD ROLLERS, TEXACO STARFAK NO 2 EVERY SHIFT
DRIVE CHAIN, TEXACO SUMMER BLACK OIL EVERY SIX SHIFTS
DRIVE SHAFT BEARING, TEXACO STARFAK NO 2 EVERY 25 SHIFTS
CONVEYOR ROLLERS, TEXACO STARFAK NO 2 EVERY SHIFT
PLUG FOR GEAR CASE, TEXACO TEXOL "K" KEEP FILLED - CHECK EVERY THREE SHIFTS
DRUM SHAFT BEARING, TEXACO STARFAK NO 2 EVERY 25 SHIFTS
ARMATURE BEARINGS, TEXACO STARFAK NO 2 EVERY 25 SHIFTS
MAIN DRIVE SHAFT BEARING, TEXACO STARFAK NO 2 EVERY 25 SHIFTS
UNIVERSAL JOINT CONVEYOR CHAIN, TEXACO SUMMER BLACK OIL EVERY SIX SHIFTS
PUMP DRIVE BEARINGS, TEXACO STARFAK NO 2 EVERY 25 SHIFTS
AXLE BEARINGS, TEXACO STARFAK NO 2 EVERY SHIFT
TRACTION DRUM, TEXACO STARFAK NO 2 EVERY SHIFT
REAR CONVEYOR DRIVE BRGS., TEXACO STARFAK NO 2 EVERY 25 SHIFTS
MAIN GEAR CASE BEARINGS, TEXACO STARFAK NO 2 EVERY 25 SHIFTS
PIVOT SHAFT BEARING, TEXACO STARFAK NO 2 EVERY 25 SHIFTS
REACH GEAR BEARING, TEXACO STARFAK NO 2 EVERY 25 SHIFTS
FRONT HEAD CLUTCH BEARINGS, TEXACO STARFAK NO 2 EVERY 25 SHIFTS
TEXACO
UNIVERSAL JOINTS, TEXACO MARFAK NO 2 EVERY SHIFT
ROLLER CHAIN BOX, TEXACO STARFAK NO 2 EVERY SIX SHIFTS
CONVEYOR ROLLER, TEXACO STARFAK NO 2 EVERY SIX SHIFTS
REAR CONVEYOR DRIVE GEAR BOX BEARINGS, TEXACO STARFAK NO 2 EVERY 25 SHIFTS
REAR CONVEYOR DRIVE SHAFT BEARINGS, TEXACO STARFAK NO 2 EVERY 25 SHIFTS
HYDRAULIC OIL TANK, TEXACO REGAL OIL "C" CHECK LEVEL EVERY SHIFT
DRUM SHAFT BEARING, TEXACO STARFAK NO 2 EVERY 25 SHIFTS
REAR CONVEYOR CLUTCH, TEXACO PYRAK GREASE EVERY SHIFT
CONVEYOR ROLLERS, TEXACO STARFAK NO 2 EVERY SHIFT
ROLLER CHAIN BOX, TEXACO STARFAK NO 2 EVERY SIX SHIFTS

CHARTS FOR UNDERGROUND MACHINERY ARE AVAILABLE

TEXACO

Maintenance
EFFECTIVE LUBRICATION

LOADERS LUBRICATED BY CHART, NOT BY CHANCE

Texaco Maintenance Lubrication Charts Available

Write for yours today, no obligation

THE coal mining industry's 1942 tonnage will total 615 to 620 million tons . . . an all-time high.

Outstanding as this is, 1943 production may reach 670 million tons.

To reach this goal, effective lubrication of your underground mining machinery will be more necessary than ever. To help you achieve this, Texaco Maintenance Lubrication Charts will continue to be available at no cost or obligation.

These Charts show exactly *how, when* and with *what* lubricant to service each lubrication point of specific makes and models of cutters, loaders, locomotives, and other underground machinery, with products approved by the manufacturer.

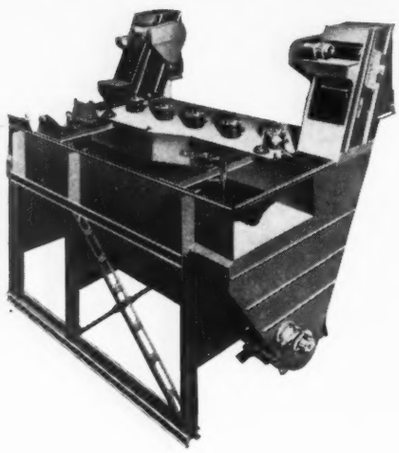
As designs change, revised charts will be promptly available.

Order the charts you need by *make* and *model,* enough for all lubricating stations . . . and in this way assure yourself of less time out for repairs, maximum service life from expensive machines and replacement parts. Address: The Texas Company, *National Sales Division, Dept. C,* 135 East 42nd Street, New York, N. Y.

MAINTENANCE LUBRICATION

FOR THE COAL MINING INDUSTRY

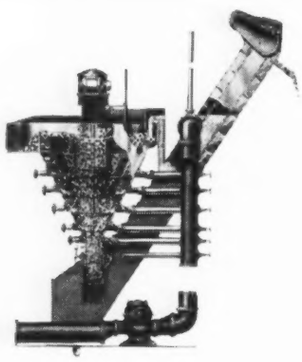
HOW to CLEAN YOUR COAL TO MEET MARKET DEMANDS

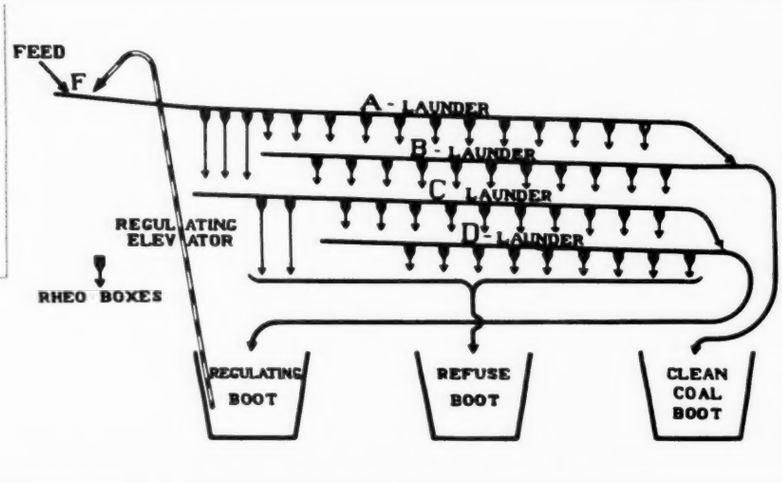


McNally-Norton Automatic Washer for cleaning coal within a large size range such as 6″ x 0″ (Patented).

McNally-Rheo Coarse Coal Launder for cleaning sizes larger than ⅜ inch (Patented).

McNally-Menzies Cone Washer for cleaning sizes larger than ⅛ inch (Patented).





McNally-Rheo Fine Coal Launder for cleaning sizes smaller than ½ inch (Patented).

Write for Bulletins

McNALLY PITTSBURG MFG. CORP.

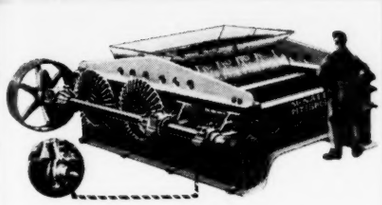
Manufacturers of Equipment to Make Coal a Better Fuel

Main Office and Works
Pittsburg, Kansas

General Sales Office
307 N. Michigan Ave., Chicago

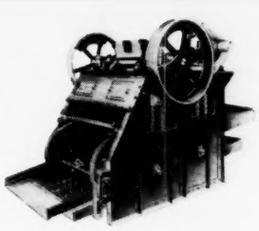
Eastern Office
Koppers Bldg., Pittsburgh, Pa.

HOW to MAKE a PROFIT SELLING AT CEILING PRICES



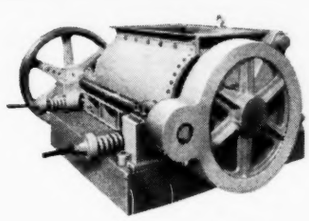
DOUBLE ROLL BREAKERS

For reducing large lump to egg or medium lump. Adjustable to produce any size between 6″ x 18″. Heavy duty and standard duty breakers are available.



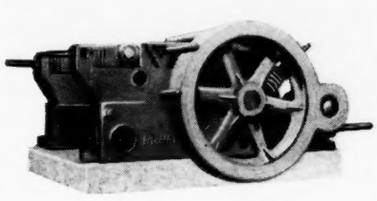
VERTICAL PICK BREAKERS

For reducing medium lump to egg or nut with least production of fines. Type B with shaking feed illustrated; also furnished in Type A with conveyor feed.



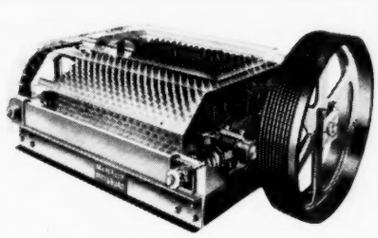
SINGLE ROLL CRUSHERS

For primary crushing to produce sizes from 8 inches to 1¼ inches. Heavy, standard, and light duty models may be had. Bulletin #342 furnishes complete data.



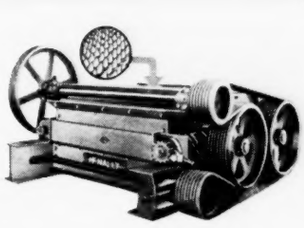
MULTIPLEX SINGLE ROLL CRUSHER

For producing screenings from 16- to 20-inch lump. This crusher allows two successive crushing stages to occur instead of the usual one.



STOKER COAL CRUSHERS

For final reduction to screenings or stoker coal sizes. This year there will be greater demand than ever before for stoker coal. Plan now to supply this demand. Three sizes: heavy, standard, and light.



SPECIAL CRUSHING

If you cannot find the solution to your crushing requirements in our standard lines, give details of your problem and we will design and build a crusher for you. Above illustrates a special design.

PROMPT SHIPMENT CAN BE MADE

BREAK YOUR COAL TO MEET MARKET REQUIREMENTS

There is a rapidly increasing demand, both in the industrial and domestic markets, for coal broken to smaller sizes. In the McNally line, there is a crusher for every size from 20″ lump to stoker coal sizes and screenings . . . and all sizes can be produced with a minimum of fines.

Check and Mail Coupon Below for Latest Bulletin

- ☐ 741 McNally-Carpenter Centrifugal Dryer
- ☐ 441 McNally-Norton Coal Washers
- ☐ 1240 McNally-Norton Unit Washery
- ☐ 142 McNally-Rheo and McNally-Menzies Cone Washers
- ☐ 941 Stoker Coal Crushers
- ☐ 342 McNally Pittsburg Crushers and Breakers
- ☐ 241-2 Vertical Pick Breakers
- ☐ 440 Rotary Dumps
- ☐ 339 Conveyor Carriers and Idlers
- ☐ 242 McNally-Vissac Heat Dryers

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307 N. Michigan Ave., Chicago, Ill.
Please send us the bulletins checked above.

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Company .....

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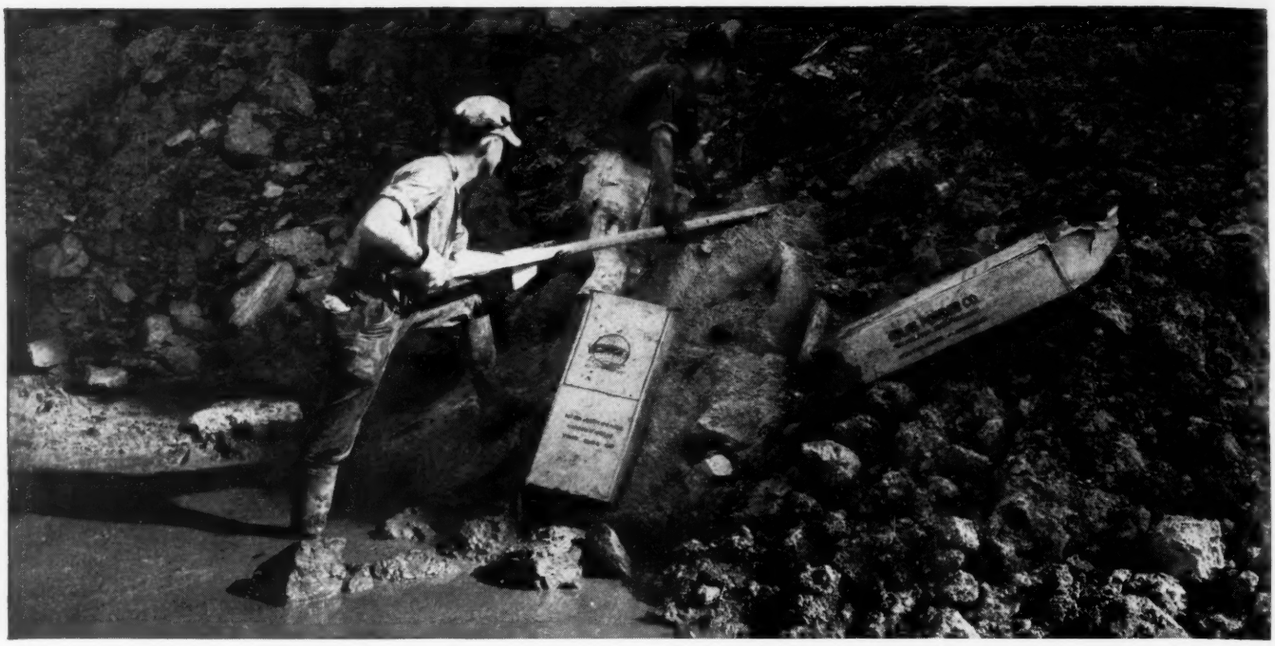


APEX is A-1 for stripping

APEX—a Low Nitroglycerine, Ammonium Nitrate type explosive—exerts a spreading, heaving action.

Available in *eight* strengths—each strength in *three* velocities (low, medium or high)—Atlas APEX gives you *twenty-four* combinations of speed and strength to suit your rock formation in removing the overburden from coal.

APEX velocity control—achieved by a novel, inner core arrangement—*assures the correct spreading, heaving action of* APEX *at all velocities and all strengths.*

Waterproof packing is available for use in wet holes. This packing is flexible for easy loading in ragged holes . . . and wire loops and loading hooks make APEX easy and fast to lower.

The outstanding stripping powder in the field, APEX is adaptable for use in either horizontal or vertical drill holes.

Arrange with the Atlas Representative to try a few holes with APEX on your next blast—*and compare results!*

APEX—Reg. U. S. Pat. Off.

ATLAS EXPLOSIVES *"Everything for Blasting"*

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington, Del.· Offices in principal cities · Cable Address—Atpowco

A Hydraulically Controlled Slabbing Machine for

A Hydraulically Controlled Slabbing Machine for

TOP CUTTING • CENTER CUTTING • BOTTOM CUTTING • SHEARING

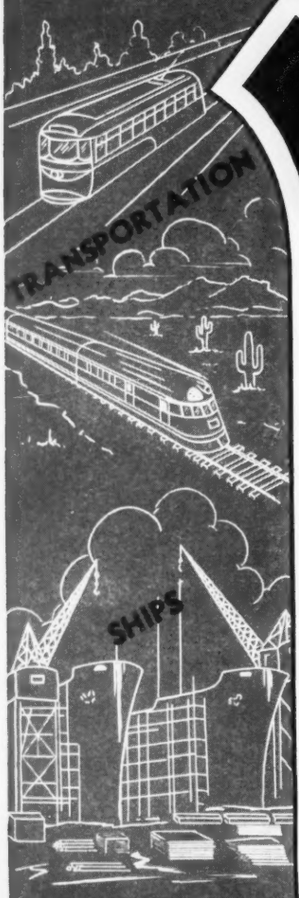
. . the Goodman **1224**

A track mounted slabber with a universal application that permits it to take the place of several single purpose machines.

Get a Goodman sales engineer
Write for Bulletin M-421.

GOODMAN MANUFACTURING COMPANY • HALSTED STREET AT 48TH • CHICAGO, ILLINOIS

P-G RESISTORS IN BASIC INDUSTRIES HELP OUR WAR PRODUCTION EFFORT



In these five industries, P-G STEEL GRID RESISTORS play an important part in the production of vital war materials and services ★ ★ ★ ★ ★

Coal Mines

On locomotives, mining machines, loaders, conveyors and other electrically driven machinery.

Coke Plants

On coal hoists, yard cranes, larry cars, door controls, etc.

Steel Mills

On cranes of all types, ore bridges, ore unloaders, charging machines, mill tables and many other kinds of mill controls.

Transportation

On motorized rolling stock for starting, braking, load regulating and speed control service. Also for turntables, shop cranes and battery charging in maintenance work.

Ships

On all types of shipyard cranes and for battery driven yard trucks. On shipboard service for auxiliary control applications such as elevators, hoists, generators and field resistors.

P-G specializes in the production of "Non-Breakable Resistors." Naturally, we take great pride in the intimate association of P-G Steel Grid Resistors with industries that constitute the backbone of the entire War Effort.

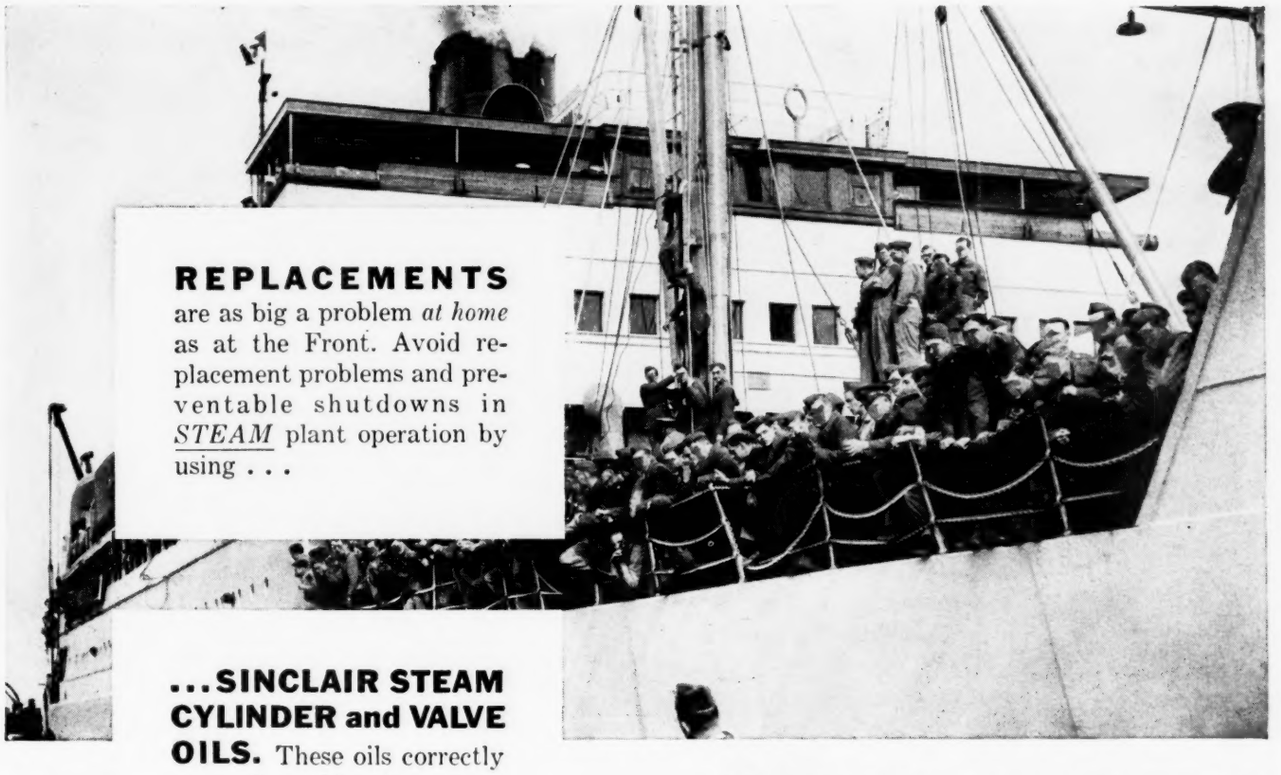
Continuous and increasing production of coal, coke, steel, transportation and ships is the keystone of our united drive to victory and to that end P-G devotes its resources.

P-G

THE POST-GLOVER ELECTRIC COMPANY

• ESTABLISHED 1892 •

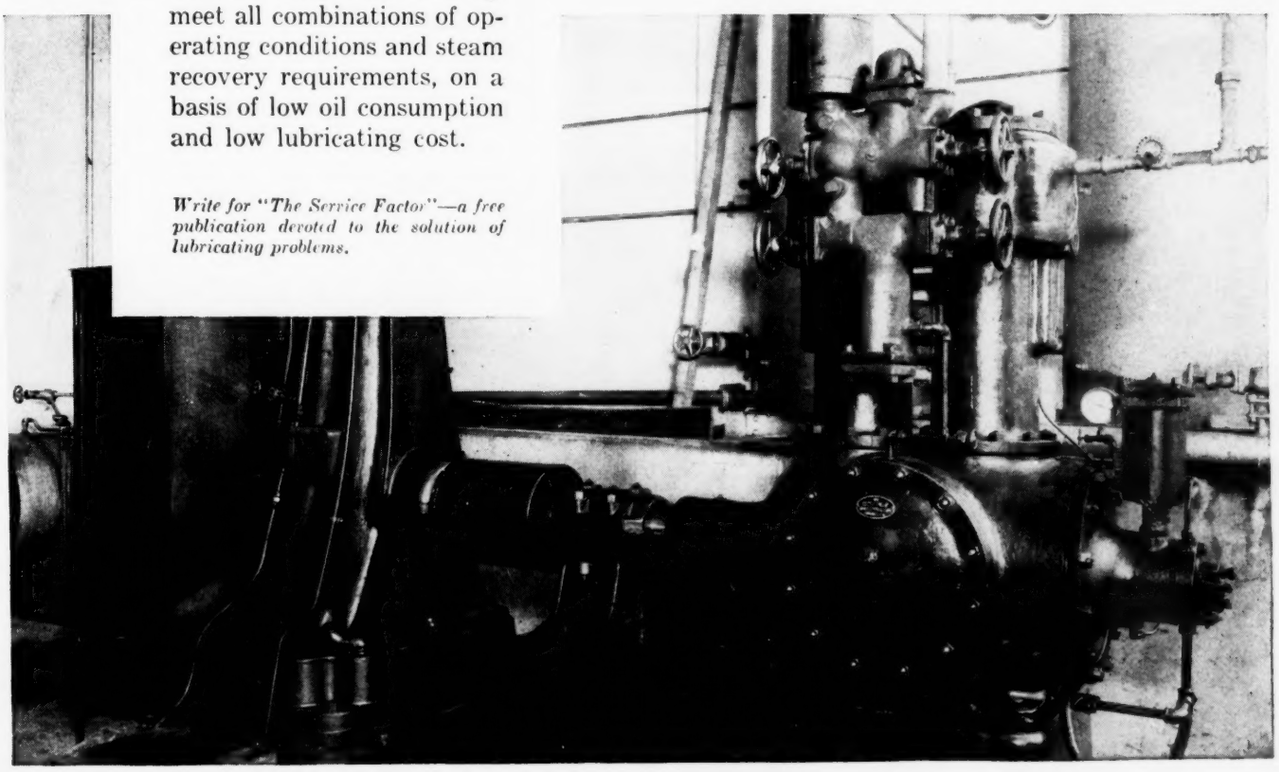
221 WEST THIRD STREET, CINCINNATI, OHIO



REPLACEMENTS are as big a problem *at home* as at the Front. Avoid replacement problems and preventable shutdowns in *STEAM* plant operation by using . . .

. . . SINCLAIR STEAM CYLINDER and VALVE OILS. These oils correctly meet all combinations of operating conditions and steam recovery requirements, on a basis of low oil consumption and low lubricating cost.

Write for "The Service Factor"—a free publication devoted to the solution of lubricating problems.



SINCLAIR INDUSTRIAL OILS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE NEAREST SINCLAIR OFFICE

SINCLAIR REFINING COMPANY (Inc.)

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FOR VICTORY
BUY
UNITED
STATES
DEFENSE
BONDS
STAMPS

America's unseen weapon (*The Mine Car*)

Back of every sweep of our fleets, every charge of our tanks, every raid of our planes, every advance of our troops, *stand thousands and thousands of mine cars*—"the cars behind the guns!"

Today, as never before, we must keep every last one of these mine cars rolling—rolling, as never before, to keep pace with our soaring war production.

If you need new mine cars, may we urge you to place your order at once. But, in many, many cases, new mine car wheels, new trucks, or other new equipment or needed repairs will step up sharply the service your mine cars can render.

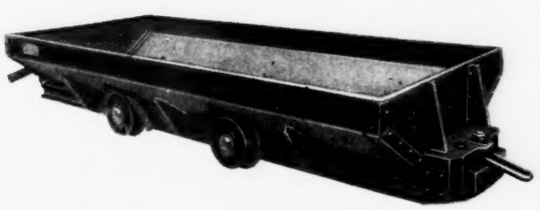
For essential new cars, or for rejuvenating repair parts, call upon a.C.f.—the nation's largest source of supply. Delivery will depend upon our securing materials. Our entire service, engineering and manufacturing resources are at your disposal to aid you to mine more coal for Victory!

a.C.f.

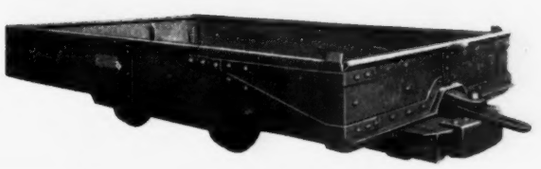
AMERICAN CAR AND FOUNDRY COMPANY

NEW YORK • ST. LOUIS • CHICAGO • PHILADELPHIA • BERWICK, PA. • PITTSBURGH • CLEVELAND • HUNTINGTON, W. VA.

a.C.f. Chilled Tread Mine Car Wheels, as manufactured under our heat-treating process, are made from a special mixture of metals—better for mine car wheels than steel or iron, alone.



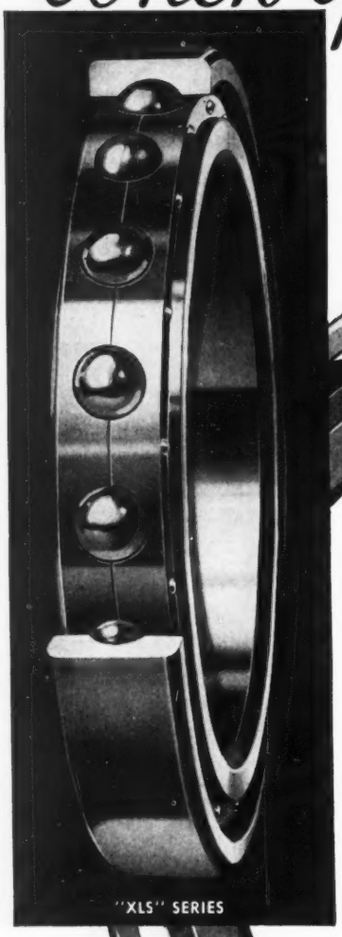
a.C.f. LARGE CAPACITY DROP BOTTOM CAR



a.C.f. LARGE CAPACITY END DUMP CAR

When You're Cramped for Space

USE THESE VERY LIGHT INCH SERIES BEARINGS

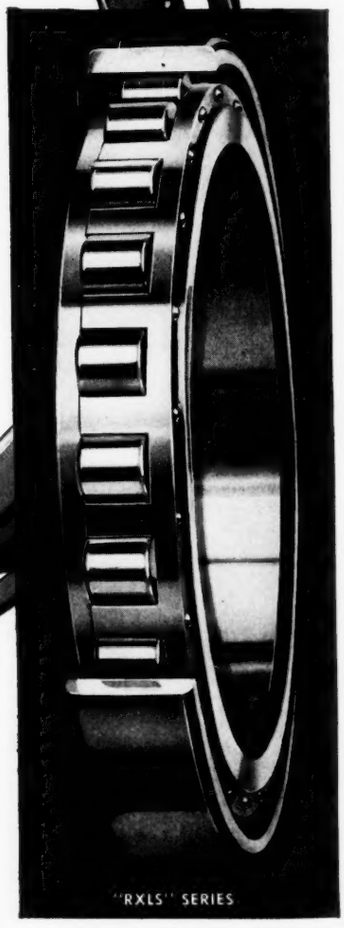


"XLS" SERIES

HAVING bores abnormally large, as compared with the outside diameter, they offer definite advantages under certain conditions found in machine design. You may have them in several different types, *affording compactness, light weight, and greater latitude in your design.*

There are several lines of very light type ball bearings, which include the "S" starting at 1/8" bore, and the "XLS" starting at 1 3/8" bore, running up to a maximum of 21" bore and 28" outside diameter. And in very light type roller bearings, there is the "RXLS" Series, paralleling the "XLS" in size range.

Why not let our engineers tell you more about these Very Light Precision Bearings? Write for the Catalog.

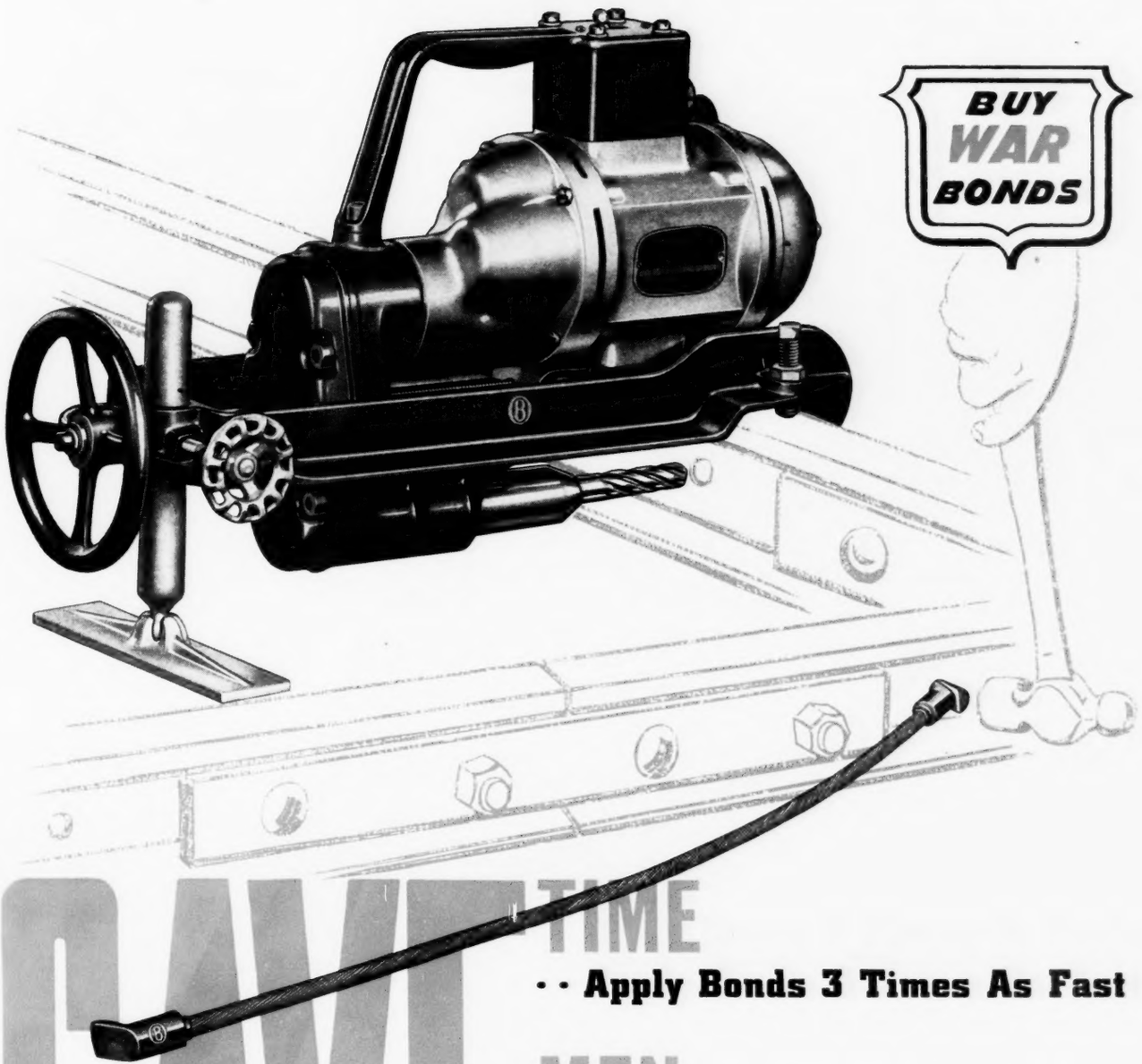


"RXLS" SERIES

"NORMA-HOFFMANN"

PRECISION BALL, ROLLER AND THRUST BEARINGS

NORMA-HOFFMANN BEARINGS CORP'N.—STAMFORD, CONN., U. S. A.



BUY WAR BONDS

SAVE

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·· Apply Bonds 3 Times As Fast

MEN
·· No Need For Skilled Welders

MATERIALS
·· No Welding Rod Required

WITH O-B WEDGE BONDING SYSTEM

2305-M

OHIO BRASS · MANSFIELD · OHIO

CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

Here's your Sturdier Tie for today's heavier machines...

BETHLEHEM No. 5 STEEL TIE

Just as mechanized operation has spread further and further through the industry these last few years, so the size and weight of mechanical equipment has been steadily increasing. That development has been all to the good so far as production goes, but it has played hob with trackwork that was never intended to take such heavy loads.

As loads got heavier, Bethlehem has kept on making larger steel ties to take the larger rail needed for room track. Now Bethlehem has developed the No. 5 Steel Tie. It's a sturdier tie all around, this new No. 5, with a heavier tie-section, bigger clips, stronger rivets—and it's designed to take rail weighing 40 lbs. per yd.

If you're having trouble with room-track maintenance, chances are you've been using too light a rail and tie for your rolling equipment and bottom conditions. That's where the new sturdy No. 5 Steel Tie can help you. It is $5\frac{1}{2}$ in. wide and $1\frac{1}{16}$ in. high, and weight of section is 5 lbs. per ft. For information write to Bethlehem Steel Company, Bethlehem, Pa., for Folder 475-A.

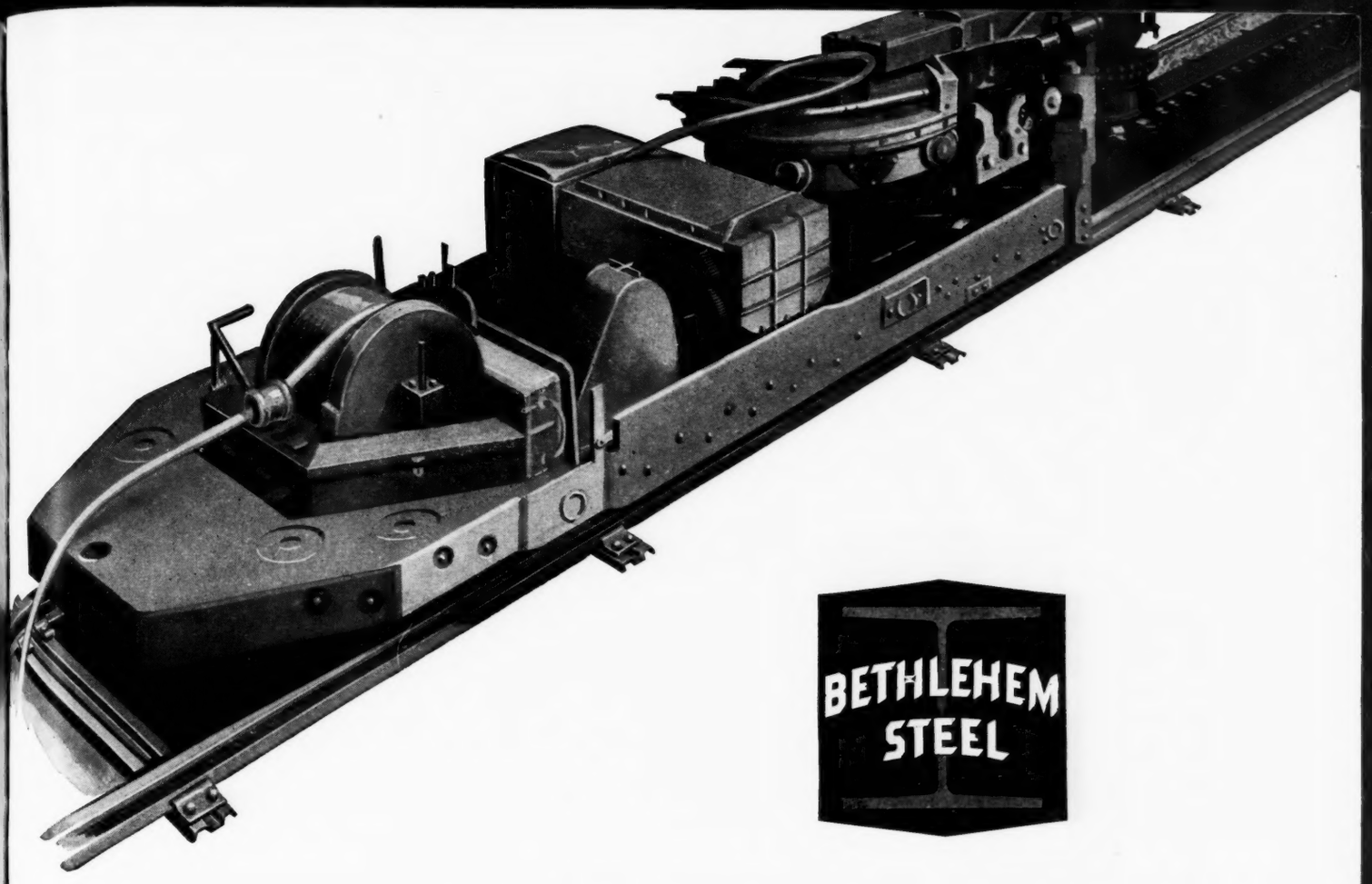
PURPLE STRAND FORM-SET WIRE ROPE IS MORE EFFICIENT

When you buy a length of Bethlehem Purple Strand Form-Set wire rope you can definitely count on two things.

First, you'll be getting the strongest, toughest, most fatigue-resistant rope in commercial use. The steel in Purple Strand Rope is 100 per cent improved plow steel.

Second, you'll be getting a rope that's easy to handle. Purple Strand Form-Set is pre-formed. Forming the individual strands before the rope is woven makes Purple Strand Form-Set limber, relaxed, easy to handle. It spools freely, doesn't need to be "seized" for cutting or splicing. It won't "porcupine."

Added up, these two points make a rope that's hard to beat for efficiency. And right now, with sleeves everywhere rolled up for maximum war production, really efficient wire rope is more important than ever before.



BETHLEHEM STEEL

BETHLEHEM-DARDELET RIVET-BOLTS HELP SPEED CONSTRUCTION

A few blows with a maul, a few twists with a wrench and a Bethlehem-Dardelet Rivet-Bolt is securely fastened. This method is now speeding steel erection on many new mine buildings, conveyors, headframes and dredges.

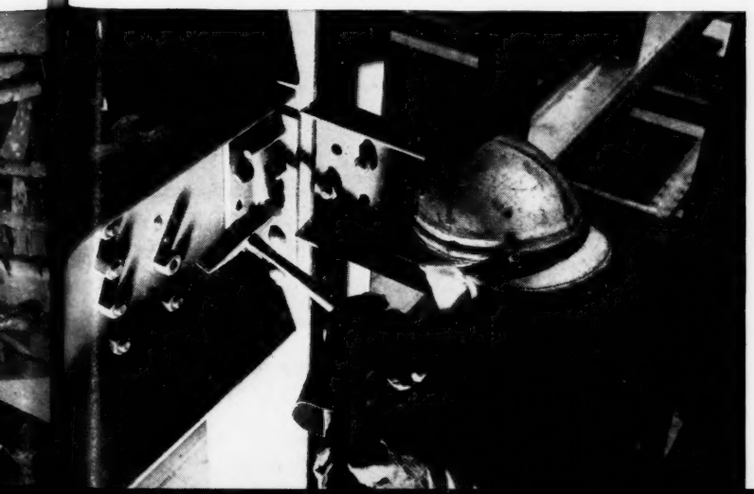
Bethlehem-Dardelet Rivet-Bolts save time; as many as 19 have been installed per man-hour. They require little equipment; a maul and a wrench do the job. No forges or compressed air are needed. A two-man crew can install Bethlehem rivet-bolts after bolting up the structural steel.

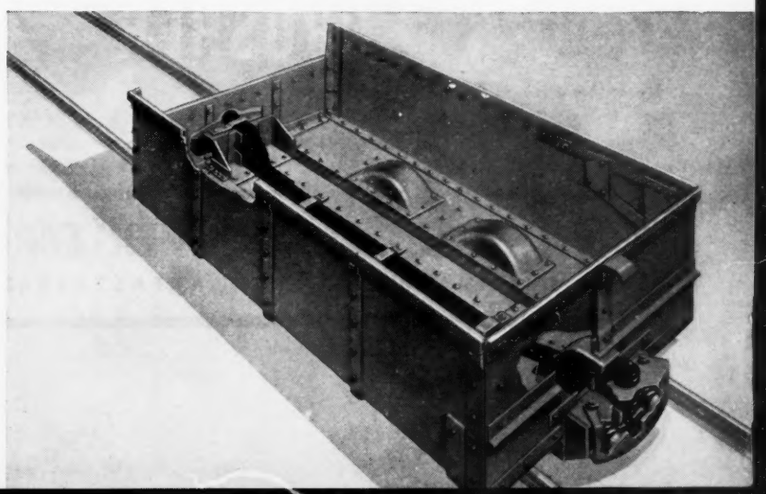
This bolt holds fast permanently because it has a ribbed grip section with an outside diameter slightly greater than the hole into which the bolt is driven. The nut holds fast because its unique Dardelet thread locks securely to the bolt when wrench-pressure is applied. Bethlehem-Dardelet Rivet-Bolts are made with button head, countersunk and special heads.

NEW BETHLEHEM MINE CAR STANDS UP IN HARD SERVICE

Ability of a mine car to stand up in hard service depends on more than massive strength. Details of design are vitally important, too. In the new Bethlehem Mine Car, we didn't depend on increasing the weight and strength of the bottom and ends to give assurance against pulling out. We went further and developed a radically new design, a mine car with unique features that give it added strength.

Bethlehem's new car has a floating drawbar—a sturdy steel member running free from end to end and transmitting pulling load and shocks to draft springs that cushion the jerks and even out the bumps. Because of that feature, ends carry no pulling load at all, giving the new car the equivalent strength and stamina of a far heavier car. For protection from the corrosive action of the coal, dual draft springs are located on the outside of the car body.





Splits THE COAL ASSURING UNIFORM SIZES

FOR EITHER STOKER OR PULVERIZED COAL BURNING

Why you get Splitting Action Instead of Crushing . . . . . .

Patented reversible manganese steel SHREDDER RINGS are found only in the American Rolling Ring Crusher.

The Rings have twenty cutting edges or teeth and are designed to maintain their outward position by centrifugal force at the specific speeds. In contact with solid metal, the rings are momentarily deflected from their usual course, because they are free to swing back out of position. No shear pins or other safety devices that require attention.

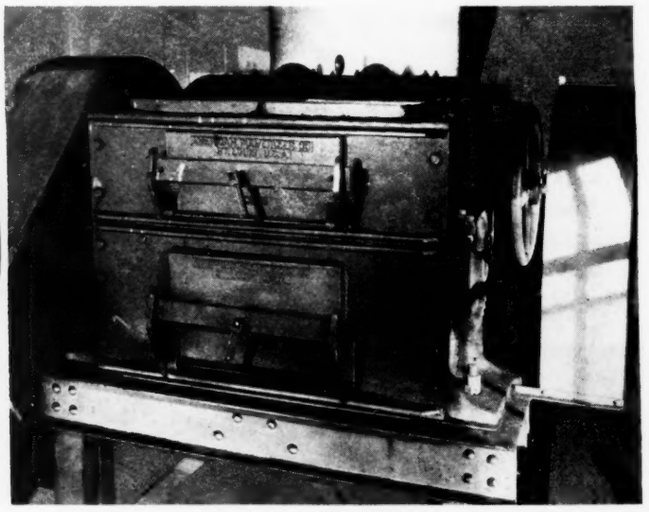
Produces large tonnages daily to help you meet immediate coal demands . . .

Your job of getting greater stoker coal tonnages to market can be accomplished with added economy with the aid of the American Rolling Ring Crusher. You get greater range of reduction—uniformity of sizes—extreme simplicity of operation—a reduction in power requirements—and greater daily tonnage.

The American Rolling Ring Crusher is built in many sizes. Each unit is arranged to meet the particular requirements of each application—each is compact, externally adjusted, easily accessible.

Write us as far in advance of your crusher needs as possible to insure fastest delivery.

AMERICAN
"AC" Type
ROLLING RING CRUSHER



AMERICAN PULVERIZER COMPANY 1119 MACKLIND AVENUE ST. LOUIS, MISSOURI

ORIGINATORS AND MANUFACTURERS OF RING CRUSHERS AND PULVERIZERS

This "WHALEY AUTOMAT" Shovel is a SAFEGUARD to MANPOWER!

Back 35 years ago, in the pioneer days of mechanical loaders, when the Whaley loader was being created—on the design board—one of the essential requirements to be met was SAFETY. The first, commercially successful, mechanical loader to be placed in operation in coal mining was a Whaley machine, and down through the years safety has played an important part in its wide acceptance throughout the industry. Sidewise jerks at the loading head of a machine causes sudden sideways reactions to rear conveyor. In close places, such action may result in dangerous knocking out of timbers or a crushing injury to men. The exclusive vertical lift shoveling action of the "Whaley Automat" eliminates the possibility of such dangers. This action is illustrated at left. After moving forward under material the "Automat" shovel lifts and simultaneously pulls backward for depositing material on jib conveyor, and then returns to shoveling position for another load. Safety to men means greater and uninterrupted production.

The "Whaley Automat" is recognized, for its ruggedness and ability to meet present day demands for fast, dependable production . . . for minimum breakage of coal and low maintenance cost. Write for fully illustrated folder giving many details and more complete information. Myers-Whaley Co., Knoxville, Tenn.

MYERS-WHALEY CO.
Only on "AUTOMAT" Shovels

Mechanical Loaders Exclusively for over 35 years

Are S-D "Automatics" SAFE?

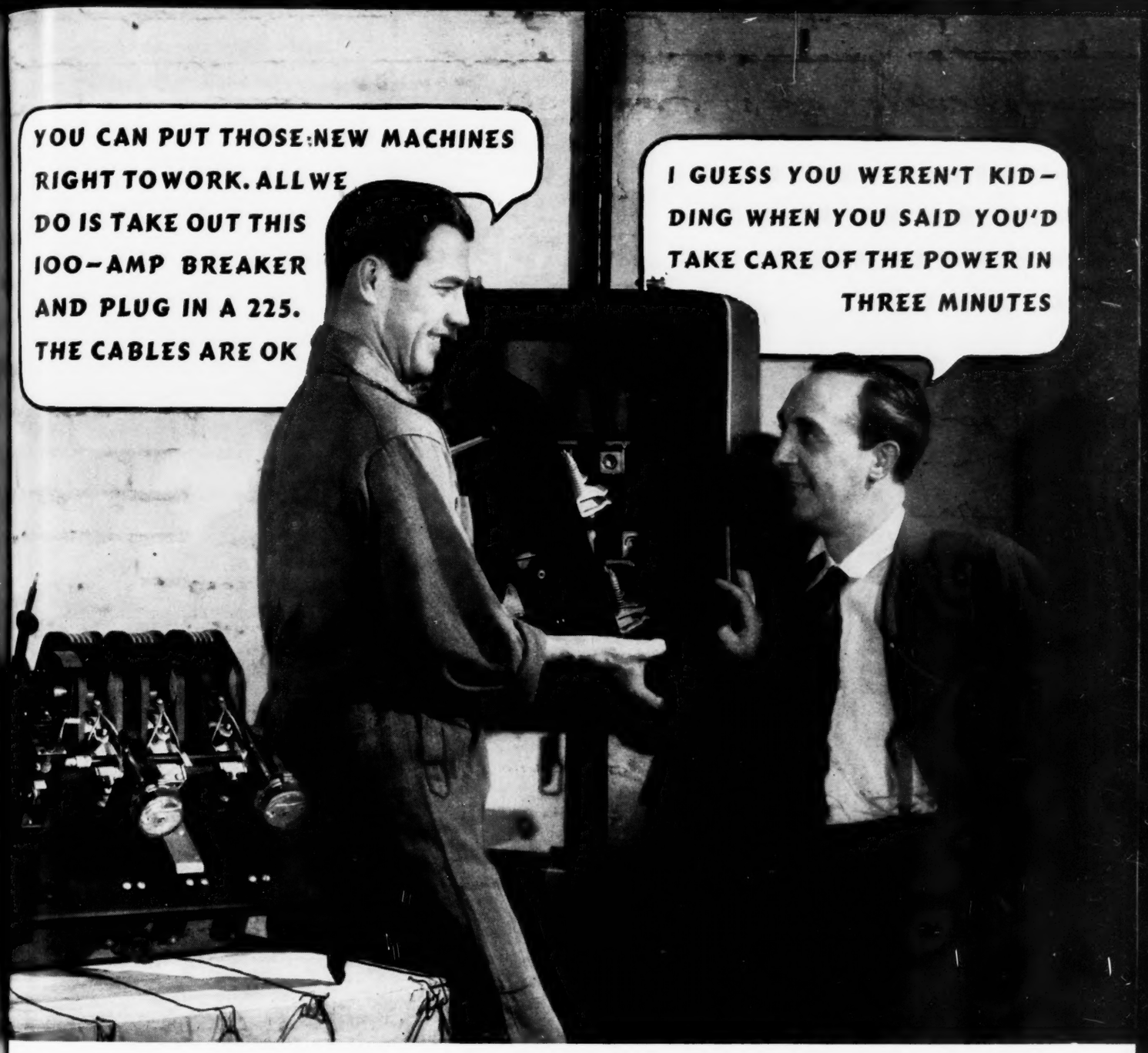
★ It is well known that past records show that, in coal mining a great number of minor injuries to workmen occur in coupling and uncoupling mine cars. In the mines where S-D "Automatics" have been installed the number of such accidents has been reduced to where they are almost negligible.

But, when you eliminate manual labor entirely, there just isn't any excuse for injuries. The new S-D "Nockout Automatic" actually eliminates all manual labor at the point of discharge. Now, S-D "Automatics" are safer than ever. With Sanford-Day's new "Nockout" door releasing mechanism, labor is eliminated entirely because there isn't a thing labor can do to assist, in any way, the releasing, closing or locking of doors. It all is automatic.

Look at the close-up latch-end view of the new S-D "Nockout Automatic" shown above. Notice that the customary protruding lever bar and associated mechanisms have been eliminated entirely. Nothing on the end of car to be damaged. Construction is simplified. Operation is fool-proof. Accidental unlatching of doors is next to impossible, because two separately operated latch hooks, completely protected above end sill structure, must be disengaged simultaneously before doors can be released. An ingenious "S-D nockout device" takes care of this job at the dumping bin.

S-D "Automatics" are vital for faster, uninterrupted production; for minimum man-power; for safety, and for savings in costs. Present day demands for tremendous tonnage call for S-D "Automatics". And, you can have them on a pay-as-you-go, liberal rental plan if you desire. Write us for the complete story.

Sanford-Day Iron Works, KNOXVILLE, TENNESSEE


YOU CAN PUT THOSE NEW MACHINES RIGHT TO WORK. ALL WE DO IS TAKE OUT THIS 100-AMP BREAKER AND PLUG IN A 225. THE CABLES ARE OK
I GUESS YOU WEREN'T KIDDING WHEN YOU SAID YOU'D TAKE CARE OF THE POWER IN THREE MINUTES

Keep Up with Shifting Loads with This New Removable Breaker

WHEN plant loads grow rapidly and shift quickly—as they do today—your breaker capacity must keep in step. If it lags behind, shutdowns and loss of valuable production time soon catch up with you! That's another reason why we built this *removable* breaker, which permits interchanging different-rated breaker units—in *less than three minutes*—to meet new load conditions.

This new breaker is equally easy to install, operate, and inspect. Because of its unique flexibility and its ability to quickly restore service after protective interruptions, it saves valuable minutes of production time daily. It protects against the damage and prolonged delays often caused when less adequate protective devices are subjected to severe short-circuits.

Install these new AE-1 breakers in your lighting, power, and motor circuits—up to 600 volts. A new booklet (GEA-3600) tells how and shows where to use them. For a copy, write the G-E office near you, or address General Electric Co., Schenectady, New York.

THE BREAKER WITH THE DISCONNECT FEATURE

GENERAL ELECTRIC

860-23-7500

below fired shells at him. And those acf
LEAD SUPPLY HELD AMPLE
WASHINGTON—In spite of heavy wartime demands on the nation's lead supply, no shortage of this important metal is in sight. Since lead is indispensible to the manufacture of storage batteries, this is good news for the many industries that depend on lead-acid batteries for power—particularly in the fields of transportation, communication, and materials handling. New storage batteries can be purchased by firms engaged directly or indirectly in war work.

You can still get the same high quality

GOULD KATHANODE

for shuttle cars and locomotives

ABOUT RATINGS—Goulds are rated conservatively. They will equal or exceed in capacity any battery of comparable size and cell structure. Buy on proven performance and you will buy Gould!

THE LEAD that goes into today's Gould batteries is the same lead that has always been used—chemically pure and unadulterated. The battery you buy will give the same top performance, the same long life you have learned to expect from Gould.

But before you buy a new battery, make sure that you are getting full service from your present equipment. Remember that Gould Kathanode, the battery with the sensational spun glass construction introduced by Gould to American industry, *lasts twice as long* as ordinary batteries lacking this feature. Proper care and attention will insure your getting the extra value that is built into Gould batteries.

FREE HELP ON BATTERY PROBLEMS—Let the Gould Service Man give you competent, disinterested advice and help on how to make your battery deliver full service. No charge, no obligation. Simply write Gould Storage Battery Corp., Depew, N. Y. Ask for free descriptive literature on any type of industrial installation.

GOULD THE BATTERY PICKED BY ENGINEERS

THE LOUIS ALLIS CO., MILWAUKEE, WIS.

THE LOUIS ALLIS CO., MILWAUKEE, WIS.

Here's a suggestion...

IT MAY HELP YOU KEEP LOADERS ON THE JOB AND INCREASE TONNAGE!

A COMPLETE LINE TO HANDLE ALMOST ANY CONDITION IN LOADER LUBRICATION

SUPERLA MINE LOADER LUBRICANTS

Four scientifically blended thickened oils for gears, clutches, transmissions and bearings.

No. 3—A dripless oil for fairly tight gear cases.

No. 5—A fibrous structure thickened oil for gears and transmissions. Particularly useful in reducing consumption.

No. 6—A smooth type thickened oil for gear cases and gathering head pots. Can be applied with pressure gun for bearings.

No. 8—A heavy thickened oil for armature bearings and make-up in cases requiring a leak-proof lubricant.

INDOILS

Three grades of straight mineral oils for hydraulic systems.

No. 95, **No. 75**, **No. 41** } Provide a range of viscosities to meet all loader hydraulic system requirements.

● HOW LONG has it been since you examined the types and grades of lubricants used on your loaders? Needs may have changed under heavy, 3-shift operation. Equipment is aging more rapidly. It's taking a lot of punishment it never had before.

Perhaps lubricating schedules should be revised, tougher lubricants used, or new and faster methods of lubricating adopted. You can find out without taking more than a few minutes of your time. Just put a Standard Lubrication Engineer on the job with one of your lubricating crews. He'll do the rest.

He has the new line of Superla Mine Loader Lubricants, particularly developed for loaders under war pressure.

With his experience in other mines, on equipment and problems just like yours, he is sure to find any possible improvement that can be made in your loader lubrication to keep equipment on the job.

Just write the nearest Standard Oil Company (Indiana) office or 910 South Michigan Avenue, Chicago, Illinois, for one of these Engineers.

OIL IS AMMUNITION...USE IT WISELY

TANDARD OIL COMPANY (INDIANA)

G...LUBRICATION ENGINEERING...LUBRICATION ENGINEERING...LUBRICATION ENGINEERING...LUBRICAT

Peaks and Valleys. It is reliably estimated that not less than 25% of the men usually engaged in mining have left the field . . . right at the moment that production demands have reached their all-time peak. This means new men—greater demands upon the remaining men. This means also appreciation of the simpler maintenance required by alkaline batteries. New men learn about their care quicker . . . the hazards of damage in unskilled hands are less.

$5,000 per Breakdown. Coal Age quotes one mine operator as saying, "I've seen it cost as high as $5,000 for a mechanical or electrical breakdown. It may run higher than that when you've got 200 men underground." The gentleman pointed a moral: the chance of a breakdown in haulage due to power failure is practically nil when the haulage unit is powered by an alkaline battery.

Price isn't Cost. Dramatic lessons are being taught today in *real costs*. It's true that the Edison Alkaline Battery is the highest-priced battery on the market. But in day-to-day operation it proves the greatest of economies because it keeps the production flowing out, is almost never off the job for repairs, lasts the longest. Thus in point of real costs it is the *bargain* among batteries.

Edison Storage Battery Division
Thomas A. Edison, Inc.
WEST ORANGE, N. J.

DURATION POWER

No one can predict how long this war will last—how long the necessity for peak production in mines will go on. But one prediction will certainly come true: the storage batteries *most* likely to last for the duration will be of the alkaline type . . . are the *least* likely to need replacement.

Endurance and dependability are literally designed into Edison Batteries. Electrochemically and structurally they are built to last a long time, to do a lot of hard work, to take severe punishment and to require very little maintenance. The result has been that where they are handling the power job in locomotives and shuttle cars that job is going well. Their efficiency is directly allied to the flow of war production.

MINING NEEDS THE DEPENDABILITY OF

Edison Alkaline BATTERIES

Say! What's happened to COR-TEN?

Yes, you guessed it! Today, every pound being produced goes directly into absolutely essential war equipment.

What's happened to Cor-Ten-built equipment?

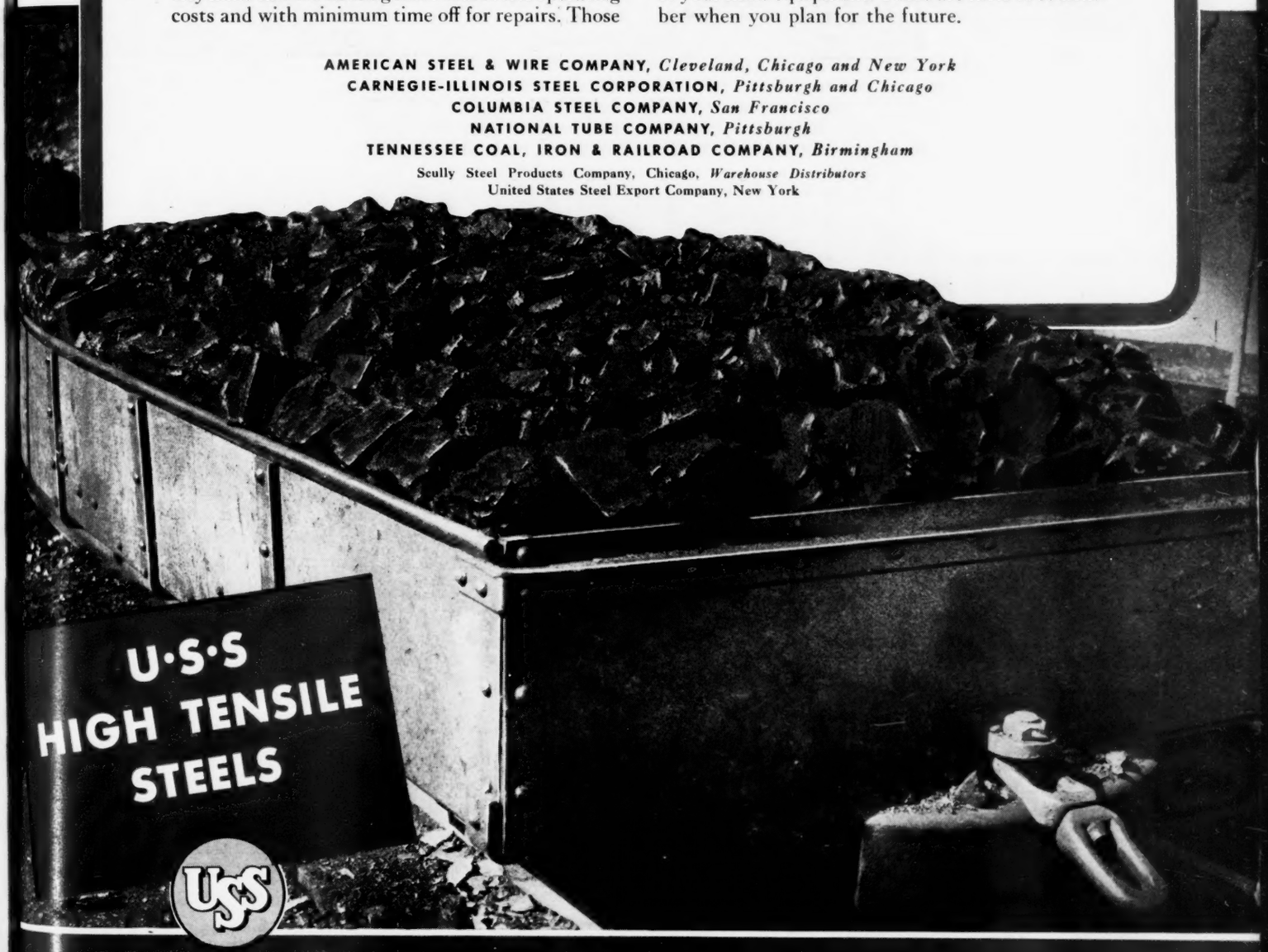
What's happened to the 10,000 mine cars built with COR-TEN? What about the hundreds of heavy-duty trucks, trail-cars, and other mine equipment that owe their strength and lightness to COR-TEN construction?

The simple answer is that this COR-TEN equipment is doing a whale of a job right now. Because of the dead weight saved and the ruggedness and stamina imparted by COR-TEN, those extra-capacity mine cars are hauling more coal at less operating costs and with minimum time off for repairs. Those trucks and trailers are carrying bonus loads of vitally needed coal and doing it at minimum cost. In coal mines all over the country, COR-TEN equipment, wherever used, is giving the kind of all-out service the war demands.

Is Cor-Ten coming back for general use again?

It certainly is! When Victory is won COR-TEN will again be available to increase capacity, save weight, reduce operating costs and prolong the life of your mine equipment. These are facts to remember when you plan for the future.

AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York*
CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
NATIONAL TUBE COMPANY, *Pittsburgh*
TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham*
Scully Steel Products Company, Chicago, *Warehouse Distributors*
United States Steel Export Company, New York



UNITED STATES STEEL

FIGHT WEAR

with Cities Service Precision Lubricants

Supplying the coal to fire the engines of victory is one of the big, tough jobs of the war. Quotas call for more, *more*, MORE coal, produced faster! How to keep machinery running at peak efficiency when it must carry such a tremendous added burden is a real challenge. And it is one that Cities Service can help you meet.

Under the severest tests of actual mining operations, Cities Service lubricants have proved precision-perfect for hard-working coal mine machinery. Use them and they'll help you meet your quotas—efficiently, economically, and on schedule.

To start off right, we suggest you first have a talk with a Cities Service lubrication engineer. Let him study your set-up and recommend a lubrication plan designed for your particular need.

Our customers have found it the most practical way to assure themselves of steady, non-stop production.

There is no charge, nor obligation, for this consultation. Simply write on your letter head to our nearest office, requesting that a lubrication engineer call.

OIL IS AMMUNITION—USE IT WISELY!

CITIES SERVICE OILS
ONCE-ALWAYS

Write to —
CITIES SERVICE OIL COMPANY
Room 1326, Sixty Wall Tower, N. Y.

or any of the following offices:
CHICAGO · CLEVELAND · ST. PAUL
KANSAS CITY · BOSTON · TORONTO

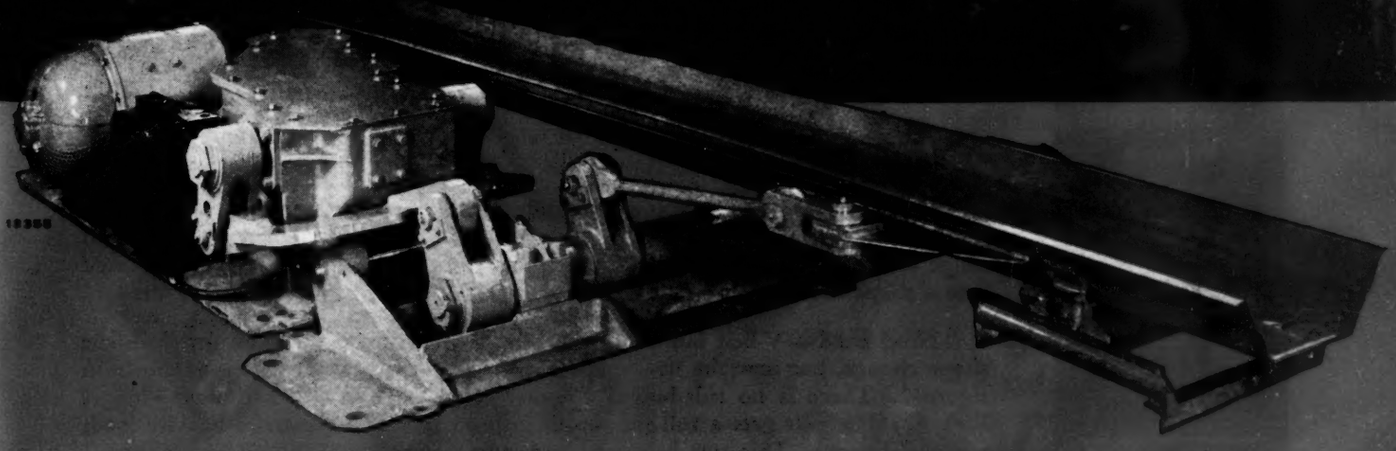
or to
ARKANSAS FUEL OIL COMPANY
SHREVEPORT · ATLANTA · BIRMINGHAM

Cities Service Special Coal Mining Machinery Lubricants.

Loader Greases	Diesel Engine Oils
Compressor Oils	Cable Compounds
Compressor Oils	Gear Lubricants
Car Journal Oils	Hydraulic Oils
Ball & Roller Bearing Greases	Steam Cylinder Oils

A LUBRICANT FOR EVERY INDUSTRIAL NEED

SHAKER CONVEYORS...

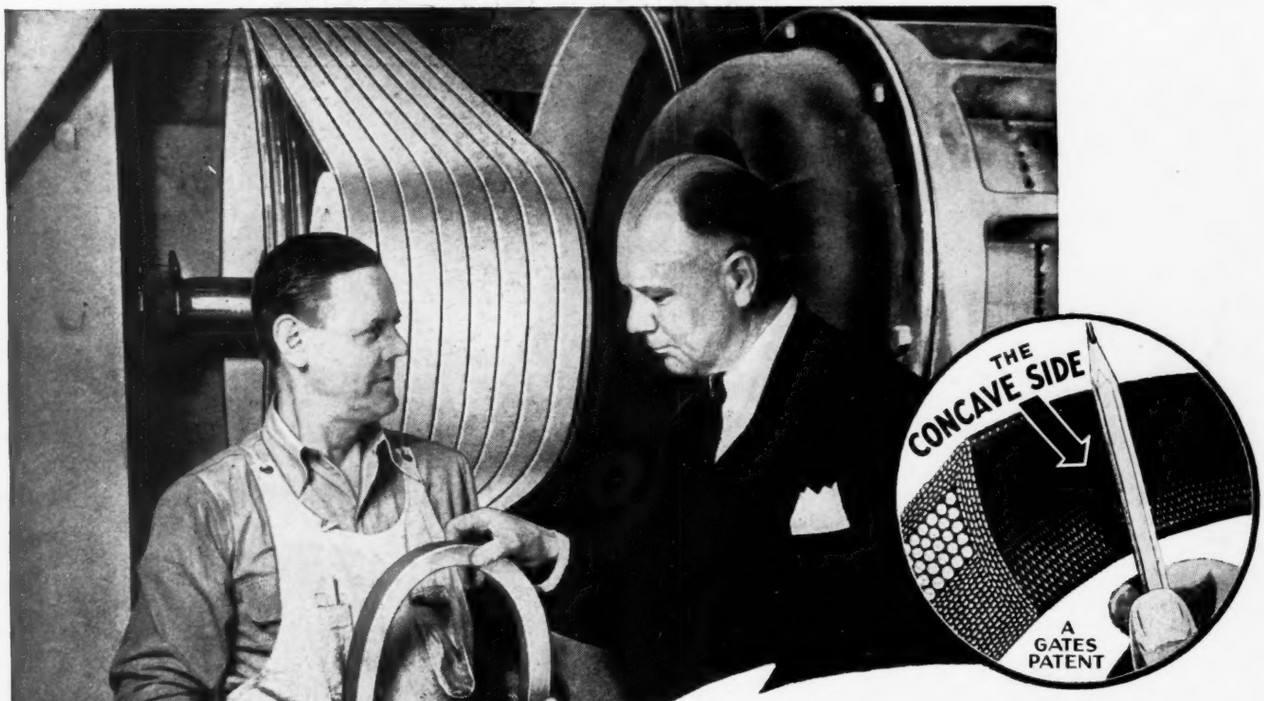


Profitable in Low Coal

Low coal is no handicap to Goodman shaker drives equipped with side drive attachment.

GOODMAN MANUFACTURING COMPANY

HALSTED STREET AT 48TH • CHICAGO, ILLINOIS



This Simple Test Shows Why the CONCAVE SIDE Cuts Belt Costs!

What Happens When a V-Belt Bends

FIG. 1

FIG. 2

If you care about belt costs, pick up any V-belt you have handy and make this simple test:—

Bend the V-belt while you grip its sides and you will feel how the belt changes shape. The top, under tension, narrows. The bottom widens. The sides of the belt bulge out. Clearly, if its sides were straight to begin with, the bent belt is forced into a shape that does not fit the sheave groove—as shown in figure 1, on the left.

Now, bend a V-belt built with the patented Concave side. You get the same shape change, but now the new shape exactly fits the sheave groove—as shown in figure 2. There is no side-bulge. Results? (1) Uniform side-wall wear—longer life! (2) The belt gets a full side-width grip on the pulley—carries heavier loads without slippage. This cuts belt costs and saves power.

Only belts built by Gates are built with the Concave side, which is a Gates patent.

THE GATES RUBBER COMPANY

Engineering Offices and Stocks in All Large Industrial Centers

GATES VULCO ROPE DRIVES

Chicago, Ill. 549 West Washington
New York City 215-219 Fourth Avenue
Birmingham, Ala. 405 Liberty National Life Bldg.
Los Angeles, Cal. 2240 East Washington Blvd.
Denver, Colo. 999 South Broadway
Dallas, Tex. 2215 Griffin Street
Portland, Ore. 333 N. W. 5th Avenue
San Francisco, Cal. 2700 16th Street

1650 foot Jeffrey Belt Conveyor system with Timken Bearing Equipped idlers installed at the Raleigh Coal and Coke Company, Raleigh, W. Va.

Section of the Jeffrey Belt Conveyor system at the Raleigh Coal and Coke Company showing Timken Bearing Equipped idlers.

Raise your mining equipment to Victory performance standards by equipping it completely with Timken Bearings. This also will give it an advantage in meeting post-victory competition.

Every additional Timken Bearing installed in loaders, conveyors, hoists, locomotives or any other kind of mining machinery increases its capacity for work; reduces its operating and maintenance costs.

Equipment manufacturers whose engineers are fully alert to the advantages of Timken Bearings—and exploit them—are fortunate because their machines not only are *better* machines, but also *better selling* machines; for wherever wheels and shafts turn "TIMKEN" is the best-known name in bearings.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

★ ★ ★ ★ ★ ★ ★ ★ ★

HELP ASSURE VICTORY

Buy War Bonds. Conserve Rubber. Eliminate Unnecessary Travel. Use the Telephone Only When Important. Salvage All Scrap and Waste Material.

All Timken Bearing production now goes into fighting machines. However, the Timken Bearings in your motor vehicles or industrial machines will see you through the emergency—and beyond it—if you make sure they are lubricated and inspected regularly.

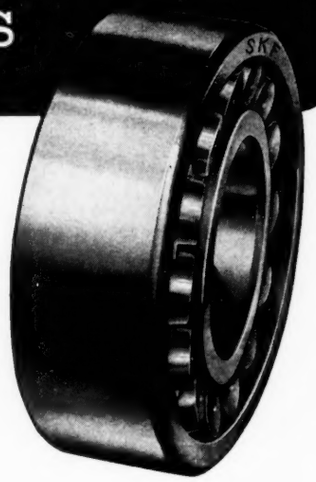
★ ★ ★ ★ ★ ★ ★ ★ ★

● *Built by*
THE JEFFREY MFG. CO.

SKF
BALL AND ROLLER
BEARINGS

Producing

550,000 *cu. ft. air on* SKF's

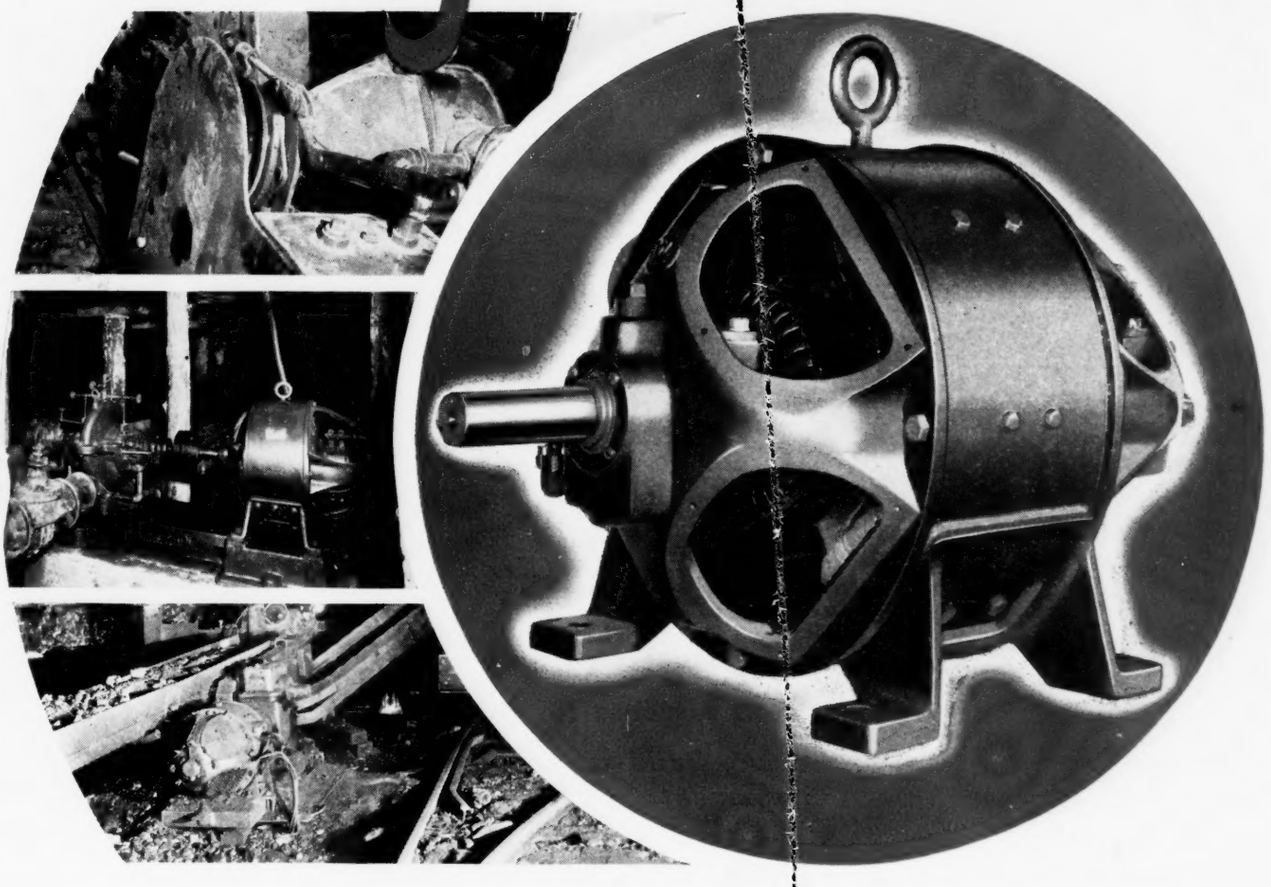


Helping coal miners *breathe* is another one of those wartime jobs that's not too big for SKF Spherical Roller Bearings. On the main fan shaft of this Jeffrey Type 8H Aerodyne Mine Fan, they're giving a good account of themselves by assuring high load carrying capacity while compensating for shaft deflections, distortions or weave . . . by never needing attention . . . by standing up in years of hard service. That means something when the 117-inch rotor on this fan produces 550,000 cu. ft. at 9" water gauge, 840 r.p.m. at 1000 B.H.P. It means carefree performance of rotating parts — not for a year or two — but for a long useful life. 5173

SKF INDUSTRIES, INC., FRONT ST. & ERIE AVE., PHILADELPHIA, PA.

here's 3 shift stamina

FOR EVERY UNDERGROUND MINING OPERATION



Type SK Motors are Designed for Mining Conditions... Built for Mining Service

One important rating never found on the name plate of any motor is *stamina*. But stamina is one of the biggest reasons there are more Westinghouse SK Direct-current Motors working in mines than any other make.

Three shifts a day, week after week, these motors stay at their work quietly doing the various jobs which have to be done in mines . . . pumping, cutting, hoisting and conveying . . . in spite of grit, dust and moisture.

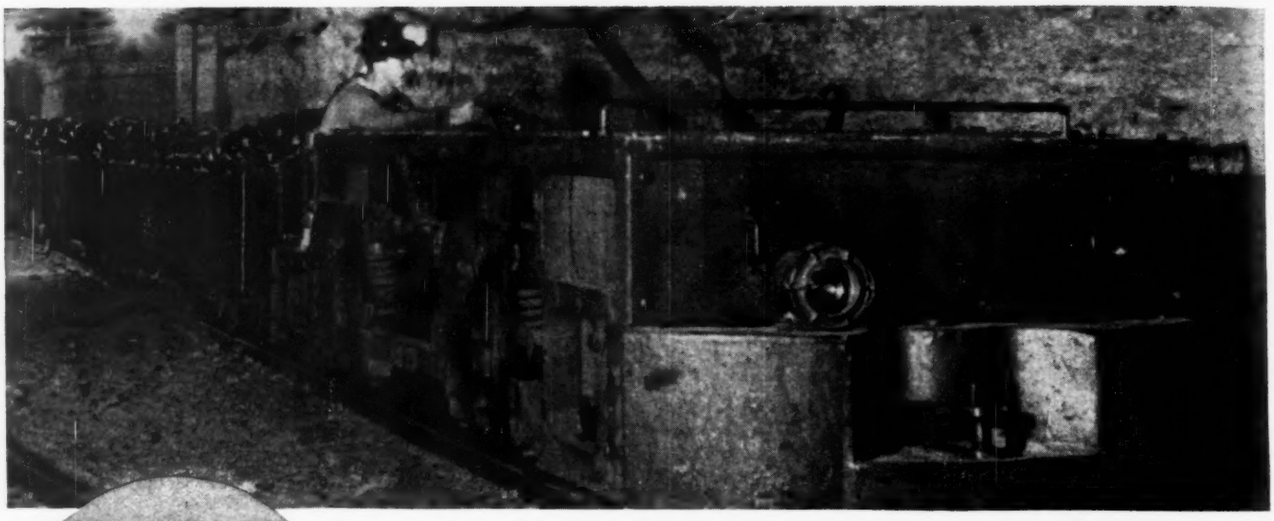
Whenever these motors do need service, the feature of interchangeable parts speeds repairs and reduces outage time. Essential dimensions of today's SK Motors are the same as those of the first ones built in 1911. Armatures, armature coils, field coils, bearings and other parts, made for the 1942 models, although vastly improved, can be used in earlier models of the same rating. This simplifies the problem of stocking parts and reduces costly inventories. It also means that repairs can be made quickly . . . that no time is lost waiting for delayed deliveries.

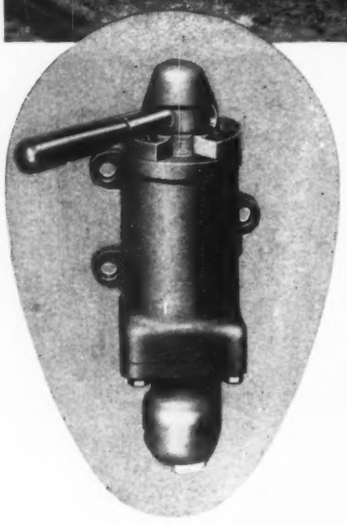
Booklet DD-4004 describes the SK Motor in detail. Ask your local Westinghouse representative for a copy. Or, write direct to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

J-21212

Westinghouse SK Mining Motors

The WESTINGHOUSE *Hydraulic* BRAKE





ITS *Distinctive* OPERATING VALVE ("Self-Lapping" Type) *Provides...*

Simple, effortless manipulation.

Instant response to operator's intent.

Pressure build-up proportional to degree of handle movement.

Prompt, precise graduation on or off.

Desired intensity easily and quickly attained.

Produces the following results: Loading operations are faster ★ Serviceability of existing equipment enhanced ★ More loaded cars kept rolling, more trips made ★ Faster haulage on descending grades, safely ★ Longer life for mechanical elements and electrical apparatus ★ Tandem operation facilitated ★ Tonnage production increased for wartime requirements.

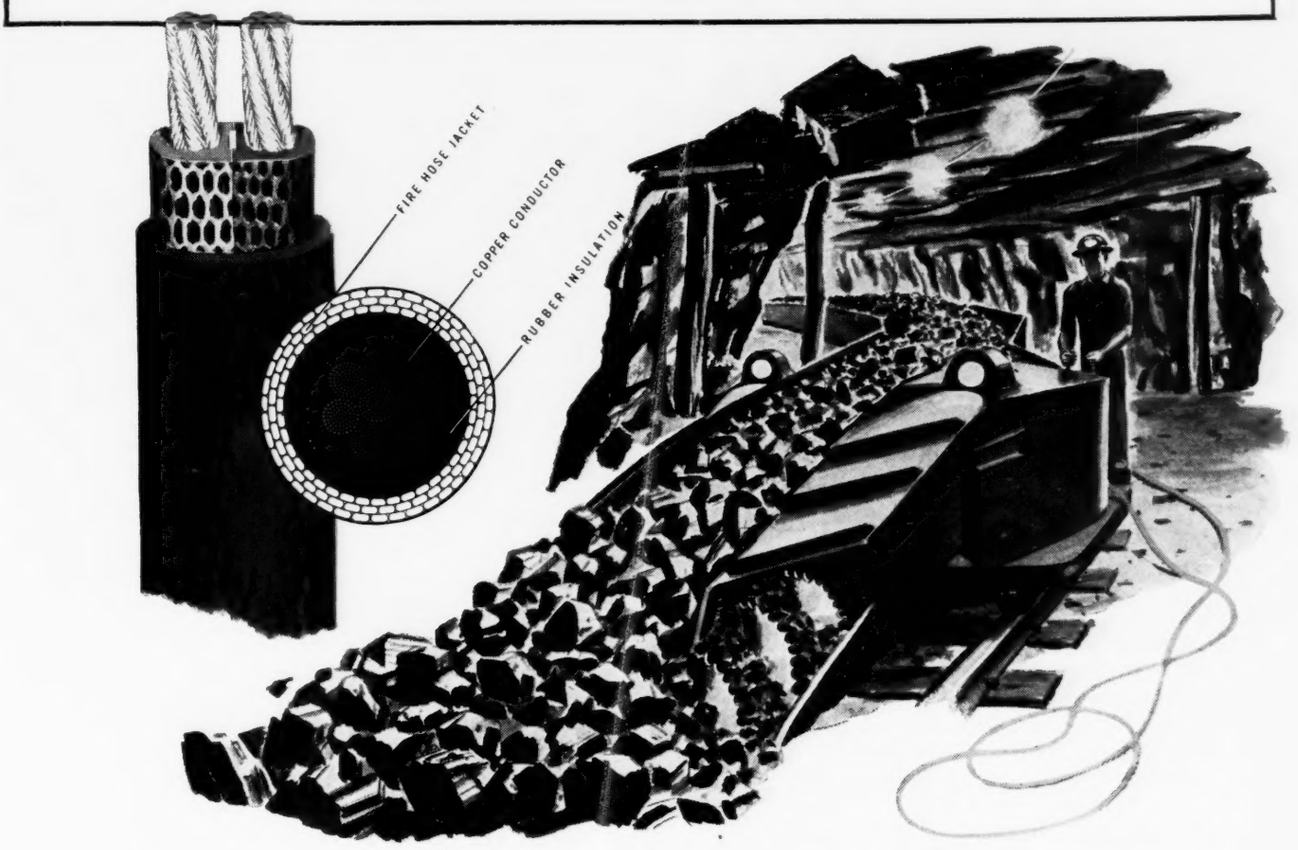
The Westinghouse Hydraulic Brake is a simple, compact system, easily installed on any small locomotive, new or old.

WESTINGHOUSE AIR BRAKE COMPANY

INDUSTRIAL DIVISION » » » PITTSBURGH, PENNA.

Duracord

the mining cable with a 20-year performance record . . . saves up to 50% rubber!



THERE is nothing "ersatz" about Duracord*; it is a cable construction developed during the last war to meet the need for heavy-duty cords and cables . . . a need it is *currently* filling not only in mines but also industrial plants and shipyards.

The Duracord covering is woven like a fine hose—*not braided.* This tough yet flexible cover replaces the rubber jacket on all-rubber cords making possible rubber savings as high as 50%.

For further information, please send us your inquiries.

SUNEX SECURITYFLEX* TO WAR

This well-known all-rubber companion to Duracord has been preempted for the toughest kind of jobs in the war effort where all-rubber cord is mandatory. Until peace, its use will be strictly regulated. 42257

*Reg. U.S. Pat. Off.

Two marks of achievement – the cherished Navy "E" (awarded to two of our plants) for achievement in production... The Anaconda trade-mark for achievement in quality.

ANACONDA WIRE & CABLE COMPANY
Subsidiary of Anaconda Copper Mining Co.
General Offices: 25 Broadway, New York
Chicago Office: 20 North Wacker Drive
Sales Offices in Principal Cities

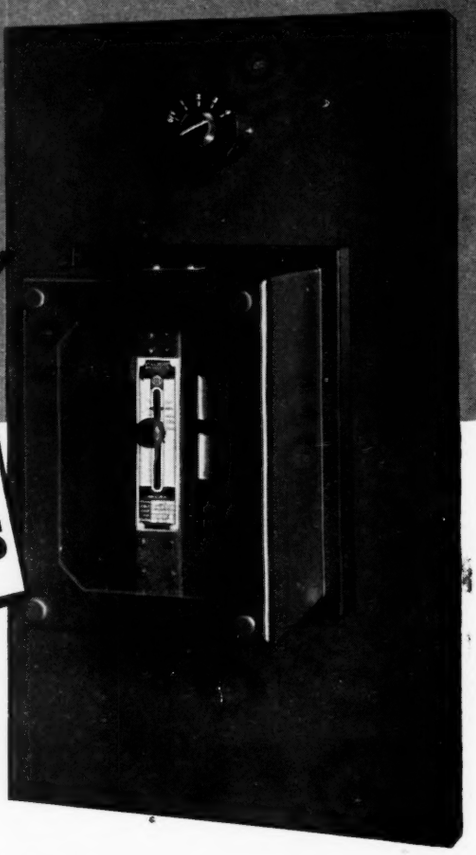
Sunex Securityflex and Duracord

ANACONDA WIRE & CABLE COMPANY

Additional Substations

made unnecessary in many mines

by I-T-E Load Distributors



The Load Distributor comes mounted on a 16″ wide by 28″ high panel and can be installed quickly in the positive generator circuit. A glass panelled, dust proof cover protects the mechanism.

USED WITH SUBSTATIONS operating in parallel in the same trolley or feeder system, a Type LDR Load Distributor operates to balance substation loads whenever peak swings above full load current are encountered.

With today's shortage of critical materials, additional rotating substation equipment is practically unobtainable. Everything possible must be done to get maximum performance from existing installations.

Many mine operators, instead of seeking more generating capacity, have installed I-T-E Load Distributors. Their function is to reduce the voltage of the overloaded substation, causing automatic transfer of excessive load to other more lightly loaded substations in the system. As soon as current is reduced to a normal amount, the lowered voltage is restored to its proper value. D-c circuit breaker outages are greatly reduced, and excessive wear on commutators and brushes avoided.

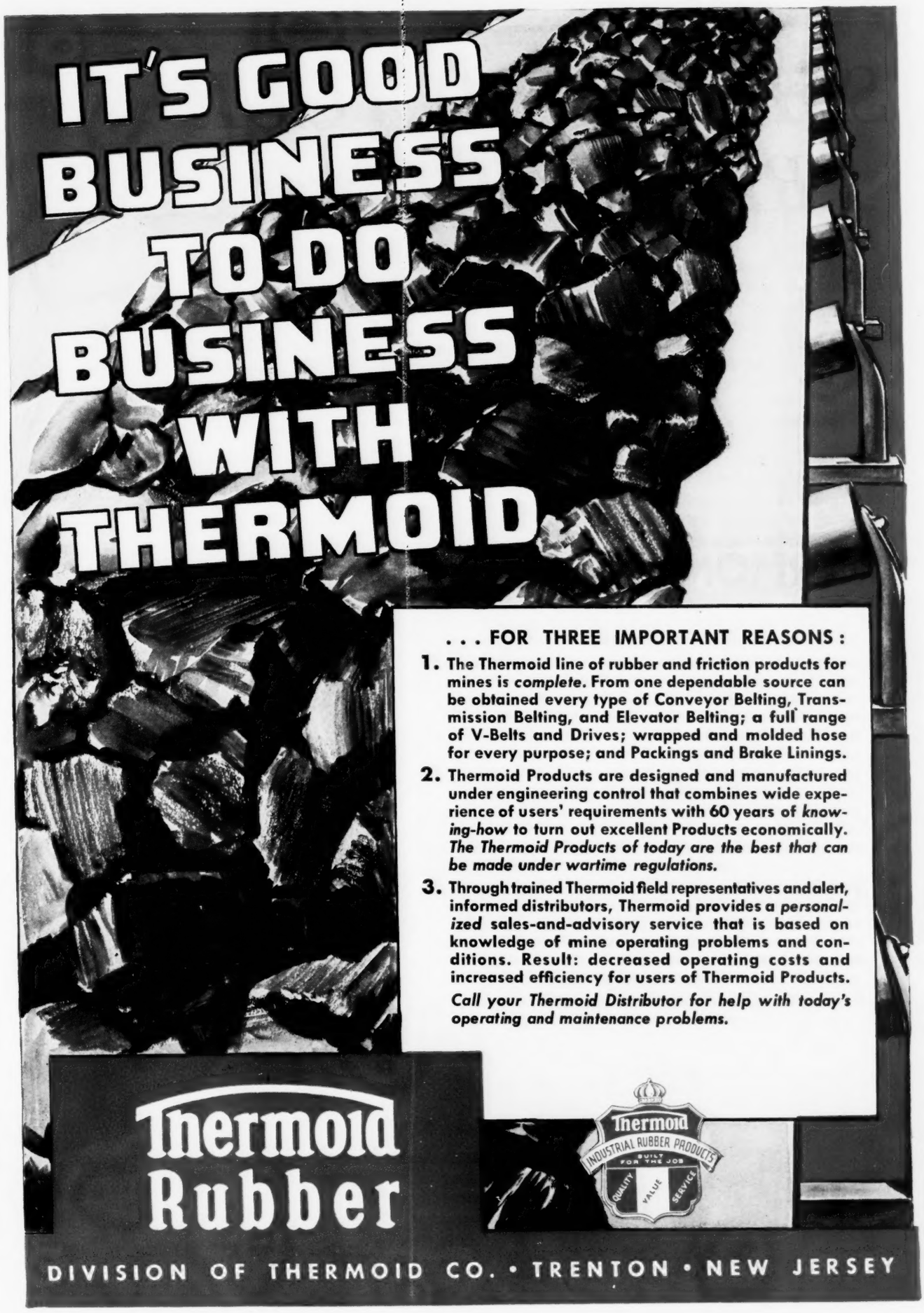
Type LDR Load Distributors are delivered completely wired, ready for installation and connection to the lines.

I-T-E AIR SWITCHGEAR

IMMERSED IN AIR — ENCASED IN STEEL

The Army-Navy "E" for Production Excellence

I-T-E CIRCUIT BREAKER CO., PHILADELPHIA, PA.



. . . FOR THREE IMPORTANT REASONS:

1. **The Thermoid line of rubber and friction products for mines is *complete*. From one dependable source can be obtained every type of Conveyor Belting, Transmission Belting, and Elevator Belting; a full range of V-Belts and Drives; wrapped and molded hose for every purpose; and Packings and Brake Linings.**
2. **Thermoid Products are designed and manufactured under engineering control that combines wide experience of users' requirements with 60 years of *knowing-how* to turn out excellent Products economically. *The Thermoid Products of today are the best that can be made under wartime regulations.***
3. **Through trained Thermoid field representatives and alert, informed distributors, Thermoid provides a *personalized* sales-and-advisory service that is based on knowledge of mine operating problems and conditions. Result: decreased operating costs and increased efficiency for users of Thermoid Products.**

Call your Thermoid Distributor for help with today's operating and maintenance problems.

Thermoid Rubber

Thermoid INDUSTRIAL RUBBER PRODUCTS BUILT FOR THE JOB QUALITY VALUE SERVICE

DIVISION OF THERMOID CO. • TRENTON • NEW JERSEY

SAFEGUARD YOUR PREPARATION PLANT..

● . . . that's a statement that can't be emphasized too strongly under today's expanded operating conditions. *You may only do your part in the war program if your preparation plant is in 100% operating condition at all times, turning out more and better coal ! ! !*

In this respect, we urge you to call on FAIRMONT regarding the repair and maintenance of any FAIRMONT-built plants or FAIRMONT-installed equipment. Your plant, as a major investment, is worthy of FAIRMONT'S efforts to help you "keep it running".

Remember—FAIRMONT stands shoulder to shoulder with you . . . to SAFEGUARD YOUR PREPARATION PLANT . . . against breakdowns due to faulty, or lack of proper maintenance . . . against delays caused by shortages of replacement parts . . . against less than maximum production due to improper use of existing equipment.

TRADE MARK REGISTERED
FAIRMONT

OFFERS YOU WET OR DRY COAL CLEANING SYSTEMS

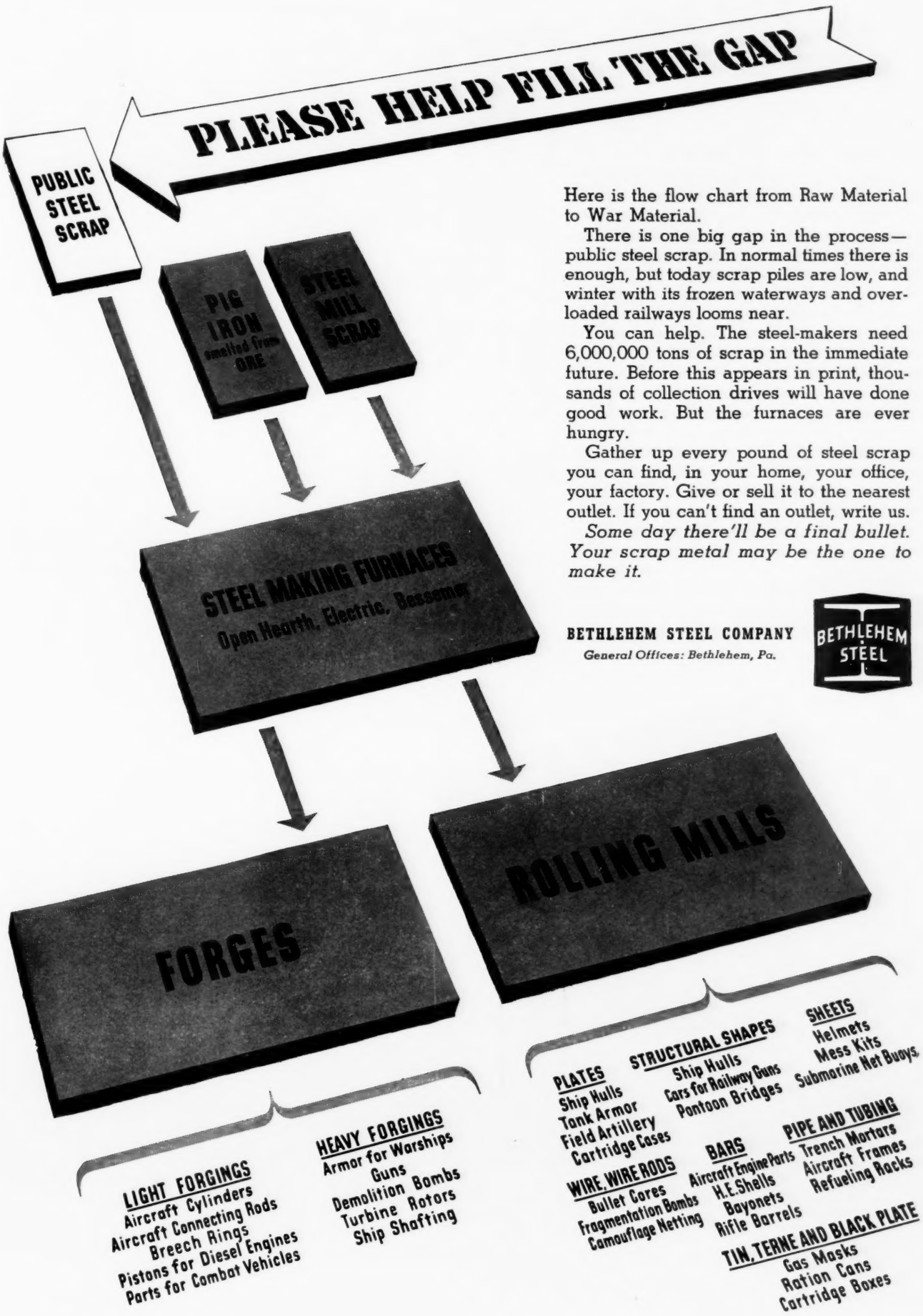
The Chance Sand Flotation System . . . a high capacity, wet process of coal cleaning . . . proved highly successful where a wet process is preferred.

The American Pneumatic Separator is a dry coal cleaning system of exceptional efficiency . . . now being used with great success by operators whose production is adaptable to dry cleaning.

SEE FAIRMONT ON ALL COAL PREPARATION PROBLEMS

FAIRMONT MACHINERY COMPANY

FAIRMONT, WEST VIRGINIA



Here is the flow chart from Raw Material to War Material.

There is one big gap in the process—public steel scrap. In normal times there is enough, but today scrap piles are low, and winter with its frozen waterways and overloaded railways looms near.

You can help. The steel-makers need 6,000,000 tons of scrap in the immediate future. Before this appears in print, thousands of collection drives will have done good work. But the furnaces are ever hungry.

Gather up every pound of steel scrap you can find, in your home, your office, your factory. Give or sell it to the nearest outlet. If you can't find an outlet, write us.

Some day there'll be a final bullet. Your scrap metal may be the one to make it.

BETHLEHEM STEEL COMPANY
General Offices: Bethlehem, Pa.

BETHLEHEM STEEL

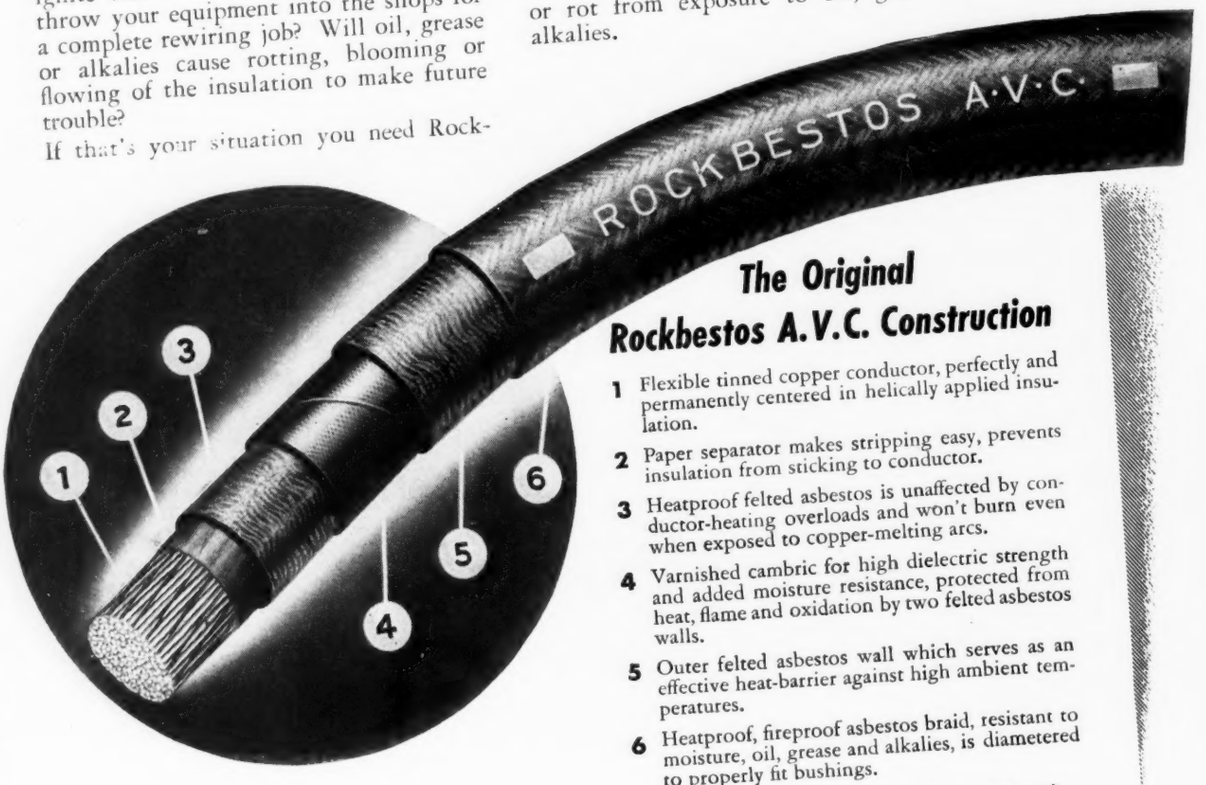
Why Put Up With Repeated Rewiring Jobs?

SPECIFY ROCKBESTOS A.V.C. IN MINING EQUIPMENT
(and for replacement)

Are your cutters, loaders and locomotives wired to operate on overtime schedules for the duration?

Will the internal cables stand up under insulation-baking overloads? Will arcs ignite and burn back the insulation to throw your equipment into the shops for a complete rewiring job? Will oil, grease or alkalies cause rotting, blooming or flowing of the insulation to make future trouble?

If that's your situation you need Rockbestos A.V.C. Mining Cable. Its permanent asbestos—varnished cambric insulation and heatproof, fireproof, moisture-resistant asbestos braid won't bake brittle under heat—won't burn even under an arc—won't dry out with age—won't crack under vibration—and won't bloom, flow or rot from exposure to oil, grease or alkalies.



The Original Rockbestos A.V.C. Construction

1. Flexible tinned copper conductor, perfectly and permanently centered in helically applied insulation.
2. Paper separator makes stripping easy, prevents insulation from sticking to conductor.
3. Heatproof felted asbestos is unaffected by conductor-heating overloads and won't burn even when exposed to copper-melting arcs.
4. Varnished cambric for high dielectric strength and added moisture resistance, protected from heat, flame and oxidation by two felted asbestos walls.
5. Outer felted asbestos wall which serves as an effective heat-barrier against high ambient temperatures.
6. Heatproof, fireproof asbestos braid, resistant to moisture, oil, grease and alkalies, is diametered to properly fit bushings.

For sizes and diameters refer to McGraw-Hill Coal Mining Catalogs or write to Rockbestos Products Corporation, P.O. Box 1102, New Haven, Conn.

ROCKBESTOS A.V.C.
The Cable with Permanent Insulation

ORDER FROM THESE JOBBERS — SPECIFY "ROCKBESTOS A. V. C."

BECKLEY, W. VA.: Beckley Mach. & Elec. Co.
BIRMINGHAM, ALA.: Moore-Handley Hdwe. Co.
BLUEFIELD, W. VA.: Superior-Sterling Co.
CLEVELAND, OHIO: Upson-Walton Co.
EVANSVILLE, IND.: Evansville Elec. & Mfg. Co.
FAIRMONT, W. VA.: Fairmont Supply Co.
HUNTINGTON, W. VA.: Banks-Miller Supply Co.
LOTHAIR, KY.: Mine Service Co.
MIDDLESBORO, KY.: Rogan & Rogan Co.
PITTSBURGH, PA.: Upson-Walton Co.
Westinghouse Elec. Supply Co.
SCRANTON, PA.: Penn. Elec. Engineering Co.
WILLIAMSON, W.VA.: Williamson Supply Co.

SAVED

IN ONE CONVEYOR BELT ENOUGH RUBBER FOR 33 JEEP TIRES

Helping you get out more coal and helping to conserve the nation's rubber supply is our job. For example, a coal mine told us they needed a 9-ply 42-oz. duck conveyor belt for a big new installation. Our engineers produced a 7-ply belt of one-third greater strength per ply. They did this by utilizing a 48-ounce duck developed by United States Rubber Company. This belt saved nearly 1,000 pounds of rubber and nearly 2,000 square yards of duck—both vital war materials!

THIS 7-PLY BELT IS STRONGER, HAS EQUAL WEARING QUALITIES AND COSTS LESS.

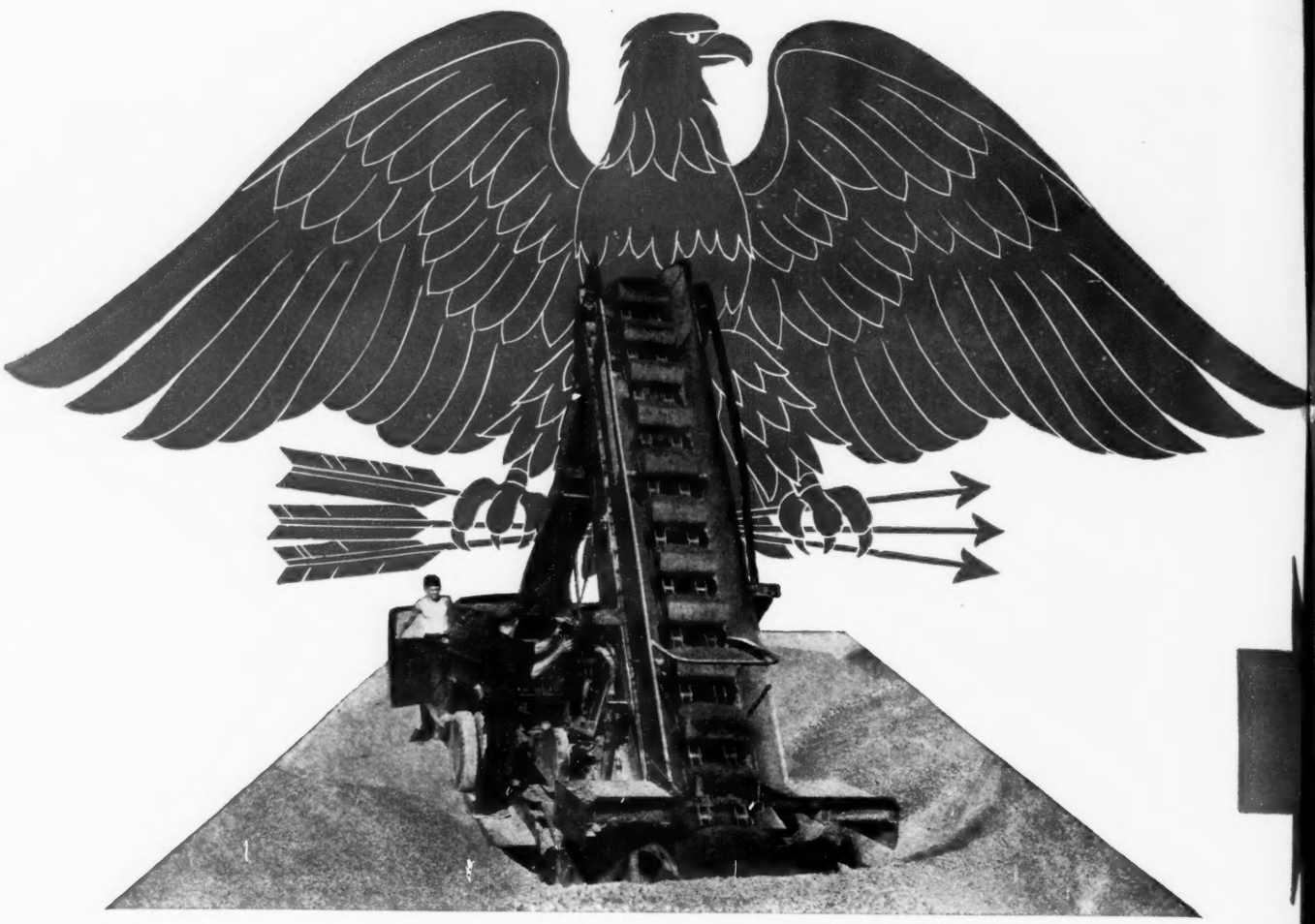
We're not attempting to sell you a 48-oz. duck belt because you may not need one, but what we would like to suggest is that you call in one of our engineers whenever you have a problem relating to belts or other essential mechanical rubber goods.

Our experience should be especially valuable to you today. Rubber must be conserved. Restrictions are mounting. Therefore, you want to be sure you're not "missing a bet"—so far as rubber knowledge is concerned.

We've "lived" with rubber compounding and belt construction for a good many years and if you do need a new conveyor belt, we will build you a *good* one, making most efficient use of precious rubber and a lot of experience.

1230 SIXTH AVENUE • ROCKEFELLER CENTER • NEW YORK

UNITED STATES RUBBER COMPANY

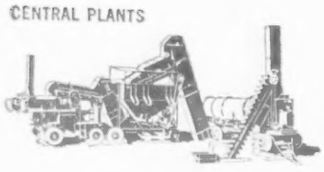


BARBER-GREENE OWNERS

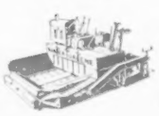
AND THE

WAR

CENTRAL PLANTS

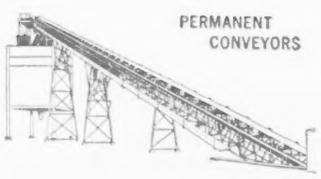


BITUMINOUS FINISHERS

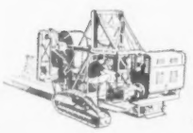


TRAVEL PLANTS

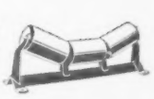
PERMANENT CONVEYORS



DITCHERS



CARRIERS



You Barber-Greene owners are fortunate in having machines which have proven their ability to last for years of service. During the present emergency, it is important that every precaution be taken to keep your Barber-Greene in good condition. The delivery of repair parts is becoming uncertain. Many broken parts are due to carelessness, or improper maintenance. It is impossible to outline here all of the points to be watched. Good, sound horse sense must be exercised.

THE IMPORTANCE OF LUBRICATION

★ Nothing can add to the life of the machine more than thorough lubrication of the moving parts, properly executed at the proper intervals with the correct lubricants. A breakdown resulting from improper lubrication is inexcusable. Correct and systematic lubrication can be maintained with little or no loss in operating time.

OPERATE WITHIN THE MACHINE'S CAPACITY

★ You will lay more road or handle more material in the long run by refraining from crowding your Barber-Greene. A good operator who has the "feel" of his machine can immediately sense an overload. There are times when momentary overloads cannot be avoided, but for the long steady pull, operate within the machine's normal capacity.

KEEP YOUR MACHINE IN PROPER ADJUSTMENT

★ Make regular checks of all of the adjustable points on your Barber-Greene. Particularly notice chain slack and bearings. A chain which becomes too loose can climb the sprocket and seriously damage the machinery.

WATCH SUCH VITAL POINTS AS THE AIR CLEANER

★ Your Barber-Greene is equipped with the air cleaner suitable for the type of work done by the machine. Many Barber-Greenes operate in highly abrasive dust which can wreck an engine if it gets into the cylinders. Carefully follow the instructions on the air cleaner, oil filter, etc.

ALWAYS GUARD YOUR RUBBER BELT

★ Load the belt evenly. Use a hopper or some other arrangement for preventing large chunks from striking the belt at the loading end. Keep the belt properly aligned. Do not convey hot materials with your Barber-Greene Belt Conveyor unless it has a special "hot belt." (Even a special hot belt can be damaged from material above 300 degrees or by hot material which is discharged onto the belt conveyor when it is idle.)

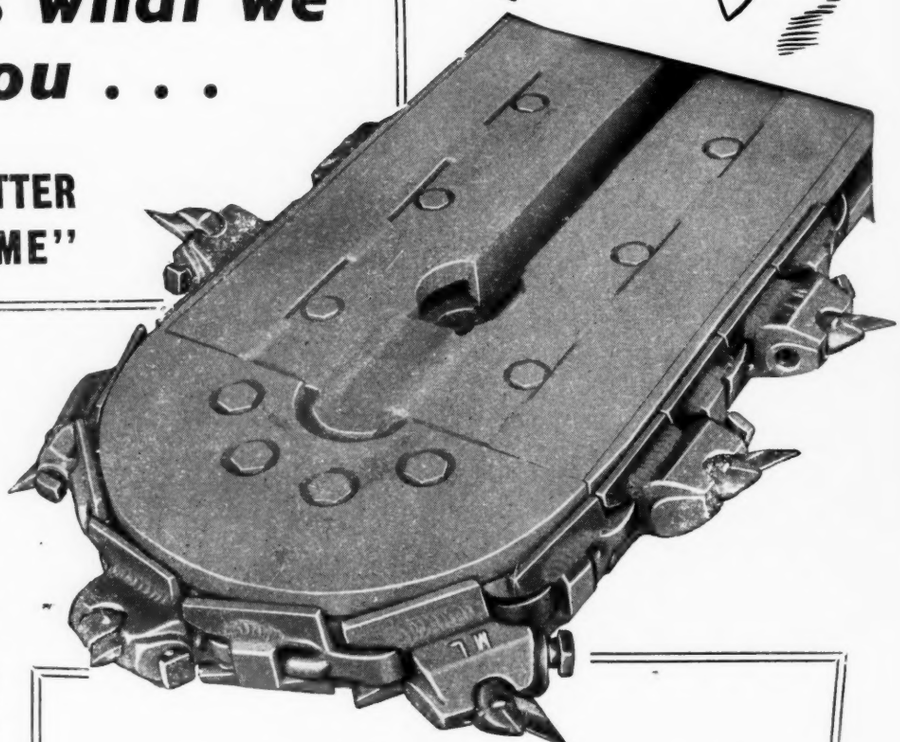
BARBER-GREENE COMPANY, Aurora, Ill., U. S. A.

GENERAL JIM SLIM SAYS:

"PRODUCTION WITH SAFETY

. . . *that's what we give you* . . .

...THE BOWDIL CUTTER BAR, CHAIN and ME"



● Maximum coal production means little time out for equipment repairs . . . no lost time accidents, caused by items which fail to measure up to safety standards. With the BOWDIL team of Cutter Bar, Chain and Bit on your coal cutting machines, you're assured of this maximum SAFE PRODUCTION at minimum cost.

Singly and together, these better products have brought remarkable cost-cutting results to numerous coal cutting operations.

And, with regular, intelligent maintenance (so necessary today), the BOWDIL Team can and will do an even more unusual job of helping you to meet the tonnage requirements of the war program.

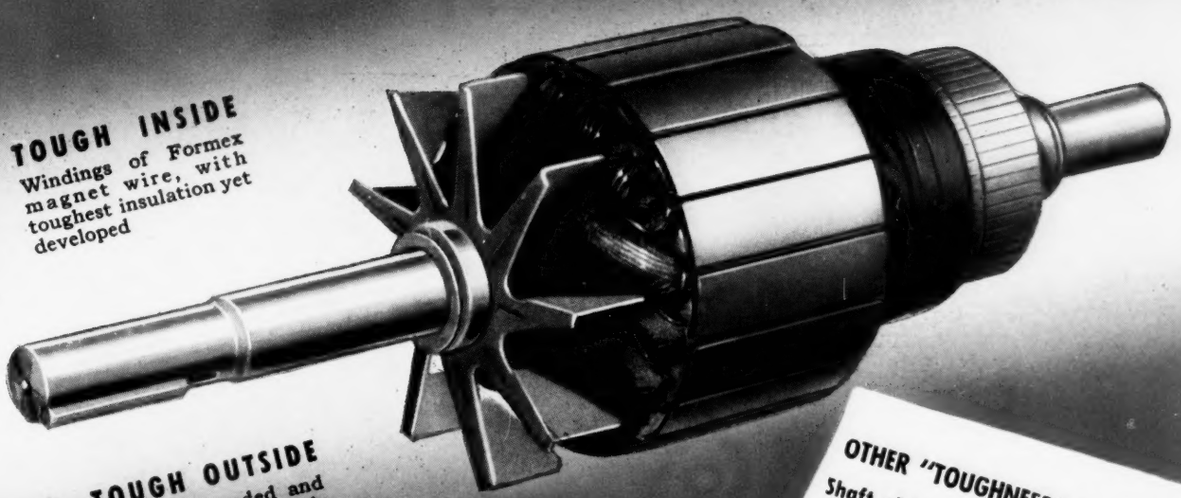
The Bowdil Company maintains service engineers in all important coal producing districts to help you maintain the highest efficiency from your coal cutting equipment. Call him in—without cost to you.

The BOWDIL Company

Canton COAL CUTTING EQUIPMENT Ohio

TOUGH from the INSIDE OUT

ARMATURE OF THE NEW G-E D-C MOTORS



TOUGH INSIDE
Windings of Formex magnet wire, with toughest insulation yet developed

TOUGH OUTSIDE
Windings bonded and protected by durable Glyptal synthetic resins

OTHER "TOUGHNESS" FEATURES
Shaft of high grade steel, accurately machined, and with ample fillets to withstand severe mechanical shock • Core of annealed, nonaging silicon steel • Laminations tightly held by welded end fingers • Positive ventilation system

Construction of This Dynamically Balanced Armature Reveals New G-E Methods of Building Vital D-c Motor Parts to Give Long, Heavy-duty Service

EVERY General Electric d-c motor armature has *inner* and *outer* protection against damage from abrasion—heat—aging—oil—alkalis—mild acids. Insulation of the Formex wire windings permanently retains its high dielectric strength. It is at least three times tougher, more flexible, and much more resistant to abrasion than conventional enamel. It shows no tendency to become brittle, crack, and lose its toughness on long exposure to heat. And the heavy, baked-in coat of Glyptal base varnish binds the windings into a solid mass that's highly resistant to mechanical injury.

Careful attention to materials and design extends to every vital part of G-E direct-current motors. Built-up commutator; heavy, adjustable brush rigging; Formex wire field coils; and improved bearings—all are built to withstand severe operating conditions.

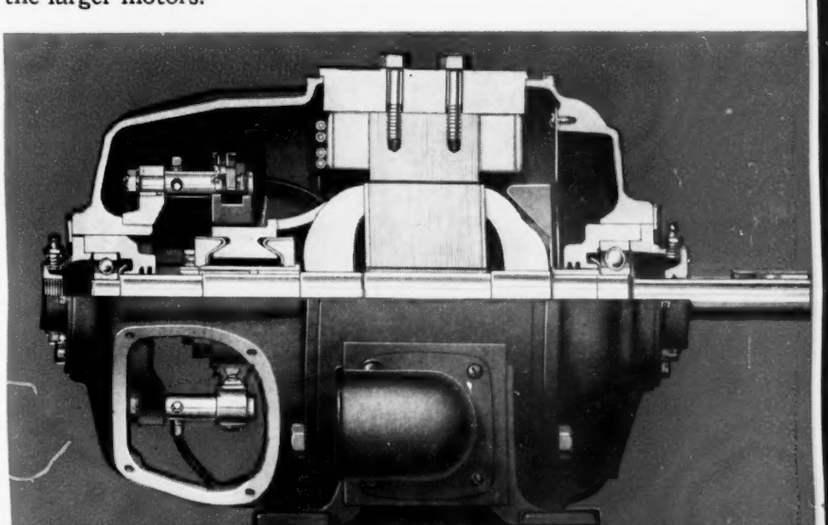
Call or write your G-E office for complete details on this outstanding new motor. And ask for your copy of GEA-1542D. General Electric, Schenectady, N. Y.

GENERAL ELECTRIC

750-72-8398

Note This Motor's New Convenience Features

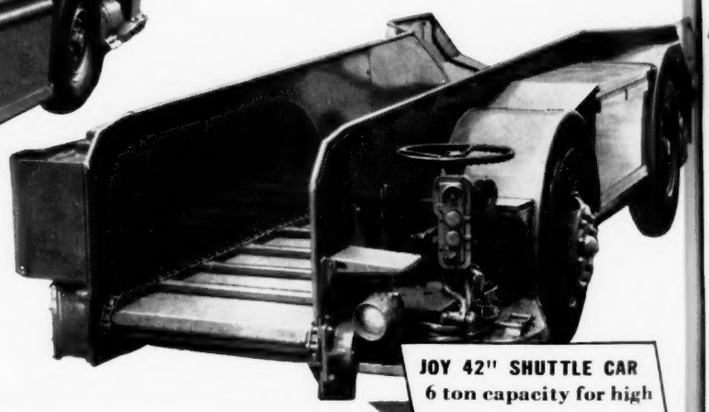
Reversal without changing any part of frame, fan, or brush rigging—Ventilating fans specially designed for efficient cooling regardless of direction of rotation—Compact assembly—Lower WR^2—Small diameter—Ball- and sleeve-bearing brackets interchangeable on the larger motors.



Sectional view, ball-bearing d-c motor (Type B). Open motors are available with ball or sleeve bearings—in constant-speed ratings from ½ to 60 hp; in adjustable-speed ratings from ½ to 15 hp.

FIRST AID TO MODERNIZATION

JOY 32" SHUTTLE CAR
3½ ton capacity for low seam operations.



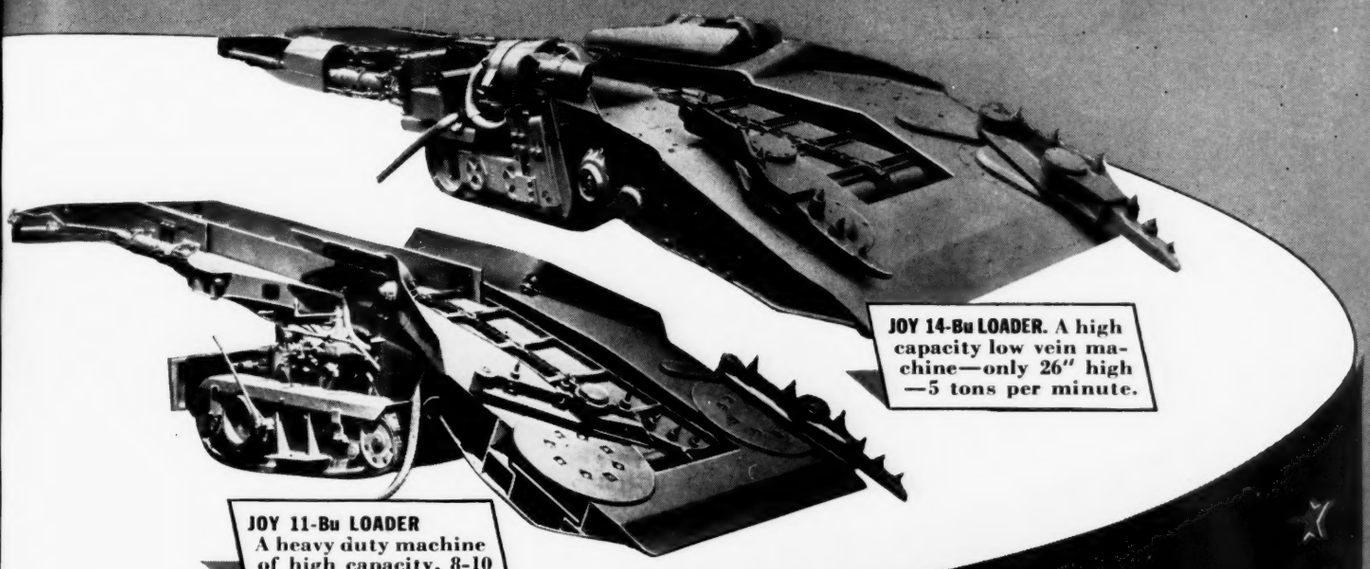
JOY 42" SHUTTLE CAR
6 ton capacity for high seams.

Joy Equipment is engineered and designed by men who are thoroughly familiar with coal mining in all of its various phases. We will be glad to check your conditions . . . study your problems and advise you factually to the best of our ability.

Consult a Joy Engineer

JOY
MECHANIZED EQUIPMENT

SPEEDS OUTPUT
LOWERS COST



JOY 14-Bu LOADER. A high capacity low vein machine—only 26" high —5 tons per minute.

JOY 11-Bu LOADER
A heavy duty machine of high capacity, 8-10 tons per minute.

JOY

MANUFACTURING CO.,
FRANKLIN, PA.

I light it . . . and walk

Experienced miners always allow themselves enough time to *walk* to a place of safety. Running at any time can be dangerous. Running in a mine can be fatal.

So—it pays to cut the fuse long enough to extend *well out* of the mouth of the bore hole when the primer cartridge is in place.

Use the brand of Ensign-Bickford Safety Fuse recommended for the blasting methods used in your mine, and the conditions under which the fuse must function.

And be careful—always.

THE ENSIGN-BICKFORD COMPANY • SIMSBURY, CONN.

Manufacturers of Safety Fuse since 1836—also Primacord-Bickford Detonating Fuse

SF-131

ENSIGN-BICKFORD SAFETY FUSE

Electronics—Secret Weapon of War

Presager of a New Scientific and Industrial Era

THE END of World War I left scientists with a new plaything. They did not know it at the time but they had their hands on a revolution. Within two years the world had radio broadcasting. Within ten years the whole art of motion pictures had been transformed as talking pictures replaced silent movies. Within twenty years television was born and people were seeing pictures in motion by radio.

The fulcrum of this revolution is the electron tube, a new tool of illimitable possibilities. One form of the electron tube is the familiar radio tube; the much publicized electric eye is another. There are many other forms, each having distinct capacities for saving time, saving energy, saving money, protecting life, limb and property.

The electron tube puts the electron to work—and the electron is the basic building-block of the universe.

Electronics is the new art, the new science of putting the electron to work. Radio and sound pictures and television are aspects of electronics; but there are many other facets of this revolution which have been brewing since the last war.

The electron tube has a typical American family tree. Edison made the basic discovery of the "Edison effect" some sixty years ago. This was followed by the invention of the "Fleming valve" and the "de Forest grid". Then Armstrong contributed his share, and hundreds of engineers in garret and cellar workshops and in the great university and industrial laboratories went to work on the tubes which employ electrons. The tube was a plaything before the last war but the world conflict brought it out of the toy stage and made it a practical, powerful tool.

Today the electron tube is guiding the destinies of the greatest armies and fleets ever engaged in the history of the world.

It is a part of the nerve center of the battleship, directing its course, finding its adversaries, broadcasting running accounts of air battles to its crews, directing gun fire and determining ocean depth.

In the air it is the means of locating and identifying enemy planes, piloting planes automatically, giving communication from plane to plane and to shore. It is even operating the controls of the plane.

In the maneuvering tank, in the officer's car, on the back of a foot soldier it transmits and receives vocal messages from every unit of the fighting forces.

Along our borders, and those of our Allies is an electronic screen which counts, follows and identifies enemy planes a hundred miles away through darkness and through fog.

In industrial plants there are electronic counters that enumerate passing articles faster than the eye can see; automatic sorters which discard defective, oversize, undersize, off-color articles; automatic cutters; devices which inspect the inside of things which the eye cannot see; controls which protect workers; controls of temperature; smoke eliminators; intruder alarms; automatic controls for whole batteries of machines.

In its October progress report on American industry, the War Production Board points out that the radio business is five times greater than a year ago. From 20 million dollars a month last fall, it has increased to well over 100 million dollars a month. Unfilled war orders are in excess of 4 billion dollars.

From such vast growth will emerge a new engineering of products which will immeasurably improve our peace-time living.

After the war broadcasting will be infinitely more satisfactory: radio receivers will perform with a new fidelity which will amaze us. Television reception will be as flawless as the motion picture. Present secret war developments will readily be convertible to peace-time devices that will improve our standard of living.

No longer will ships collide with other ships, with icebergs or the shore. No longer will trains collide and aircraft crash in flight.

Garage doors will open as we approach and automatically close themselves. Electric lights will automatically go on and off according to our wants and needs. Furnaces and boilers will be controlled and smokestacks will cease to belch wasteful smoke. Air will be made dust free and germ free. Food contamination will be checked, meat made tender.

Grade crossings will be made safe and auto traffic will be automatically controlled.

Medical science sees new wonders ahead. Already it is possible to see "whiskers" on germs, germs which heretofore had been but a blur when viewed through the strongest optical equipment available.

Today so much secret development is going on in the ultra-high-frequency field that little can be said of its great future. But, without divulging military secrets, it can be said that ply-wood is being dried electronically in minutes instead of hours. Ultra-high-frequency welding (not to be confused with flame welding controlled electronically) is being done dramatically and efficiently.

Ultra-high-frequency heating promises to revolutionize the baking industry—it may even heat our homes.

What is this miracle working tube that can see, hear, taste, feel and smell a thousand times more sensitively than was possible heretofore?

What is the electron? No one knows, not even the scientists who know how to employ it. Electrons cannot be seen or felt; but if 6¼ million million million electrons are pushed through a 100-watt electric lamp per second, it will light up to full brilliance. For electric current merely is a mass movement of electrons. Each electron carries its share of electricity, and since the electron has so little weight it can be moved easily and quickly. Therefore, electricity transported by electrons can be turned on or off with great ease and speed. The electron tube merely is a device that controls the flow of electricity. It is an amplifier of power which can be made to do wondrous things. The sound of a termite gnawing inside of a log can be amplified a million times . . . to a roar that can be heard over great distances.

Colors can be classified and matched to a degree not possible by any other means.

Chemical or vitamin consistency can be recognized by counting radio activity within the subject being analyzed.

There is no industry in which electronic circuits cannot be used to speed up production, to increase accuracy, to do heretofore impossible tasks of calibration and measuring.

The opportunities afforded the engineers who are developing this new "electronic age" are limitless.

* * * *

Today the electronic industry is 100% at war. It is meeting the exacting demands made upon it.

Never before was electronic equipment called upon to withstand temperatures ranging from 75 degrees below to 150 degrees above zero Fahrenheit. Never before did radios and transmitters have to withstand the shaking and abuse to which they are being subjected today.

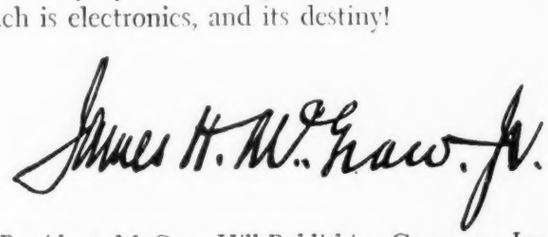
War demands have called for much redesign, much change of materials and a new conception of operating to tolerances never dreamed of in peace-time material. As a result, electronic parts and equipment makers are building better devices.

Universities and colleges are working at top speed to produce electronic engineers, for every radio operator in a plane, every radio man in the ground forces and on ships, every man operating radar equipment or electronic control devices in ordnance . . . and there are many thousands of them . . . must be a trained technician.

The wall of military censorship is high but it is no secret that one of Britain's best weapons that keeps the Luftwaffe from exterminating London is a radio locator, a device that gives alarm of approaching planes long before they can be seen with telescopes. Scanning the horizon constantly the locator warns of the enemy's approach. In the nose of a night fighter, the locator informs pilot and gunner when the enemy is within range. Neither is it a military secret that gunfire can be controlled by electronics, and that electronics is having a big share in training our new armies.

Necessity draws a veil over the most dramatic uses of electronics in warfare, but among those who know there is nothing secret about the fact that many of today's wartime applications will revolutionize our peace-time lives. Electronics will invade every industry with totally new devices and machines. The future of the electronics industry is limited only by man's imagination.

Such is electronics, and its destiny!



President, McGraw-Hill Publishing Company, Inc.

This is the sixth of a series of editorials appearing monthly in all McGraw-Hill publications, reaching more than one and one-half million readers, and in daily newspapers in New York, Chicago and Washington, D. C. They are dedicated to the purpose of telling the part that each industry is playing in the war effort and of informing the public on the magnificent war-production accomplishments of America's industries.

COAL AGE

DEVOTED TO THE OPERATING, TECHNICAL AND BUSINESS PROBLEMS OF THE COAL-MINING INDUSTRY

DECEMBER 1942

WAR-TIME SAFETY

IS THERE a possibility that war and its attendant dislocation of normal operation will result in the sacrifice of the safety gains racked up by coal mining in late years? The evidence points strongly to such a conclusion, provided the problem is not given the necessary recognition and the requisite steps taken without delay.

So far this year, it is true, the death rate at bituminous mines, on the basis of figures subject to revision, is lower (2.081 per million tons for the first nine months) than the 1941 rate of 2.092—up to that time the lowest in the history of the industry. While many companies are holding and extending their gains, the experience of many others shows that there is a good chance of the accident trend reversing itself unless extra effort is put forth. Perhaps the reversal already has occurred in anthracite, where the death rate has risen from 3.574 per million tons in 1939 to 3.807 (subject to revision) in the first nine months of 1942.

What, it might be asked, are the major factors underlying a tendency toward a higher accident rate? They include, as brought out elsewhere in this issue, loss of experienced men, who necessarily must be replaced with green hands or others less capable; pressure for production to support the war effort; and a tendency to lose the safety-consciousness so necessary for progress in this vital activity.

The problem admittedly is difficult, especially since supervisory skill now is short along with miners. It probably will grow more so. But it can be solved by increased stress on quantity and quality of supervision, right training of men and maintenance of the safety spirit, plus adoption of the necessary physical safeguards. As an extra dividend, the operator also can expect a higher efficiency.

ON THE HORIZON

OIL'S swan song is yet to be sung, but unless the rate at which new discoveries are made can be stepped up, there seems no denying that it is in, or at least close to, a period of declining reserves. The rapidity of decline naturally will depend on future discoveries and rate of consumption. That the situation is serious is reflected in the clamor for more wildcatting and for an increase in oil prices to make such wildcatting possible. But it now seems fair to say that the finding of new major pools in the United States is only a possibility rather than a probability.

In the carefree days of old, prophets of decline were confounded so often by new discoveries that the illusion of inexhaustible reserves was accepted as a fact in many quarters. The situation now is radically different, as *Business Week's* thoroughgoing analysis in its Nov. 14 issue reveals. Not the least of the conclusions is that reserves, barring large new discoveries or cuts in consumption, are relatively limited.

Lacking oil, coal is the logical source of heat and energy. Aside from use in its original state, it is a source of both gaseous and liquid fuel and other products. In the not-too-distant future, it would appear, coal may be called upon to assume a greater share of the load. It should be ready with the most efficient and lowest cost product possible, whether it be solid, liquid or gaseous, or all three. Research and more research is the answer.

MATERIALS OUTLOOK

PERHAPS the outstanding thing that can be said on the materials outlook at the present time is that it is likely to get tougher as to quantities and possibly a little easier from the standpoint of passing around those that are available. As our victory effort is stepped up, materials will become more of a problem, despite progress in promoting the output of such items as aluminum, copper and steel. At the same time, if the announced objectives of the new Controlled Materials Plan are reached, much of the confusion, waste motion and errors which have accompanied previous attempts to match demand and supply of critical materials should be eliminated.

Aluminum, copper and steel are the first to come under the Controlled Materials Plan announced last month by the War Production Board. All of these, it

will be noted, are products of the mines, including coal mines. Who can conceive, for example, the production of steel on the scale now necessary in the United States without coal? Or the operation of our factories, utilities systems and railroads? Or the heating of our homes? There is no danger of coal losing its essential character.

As an essential industry, coal can expect to continue to get its fair share of available materials, although the volume possibly may be smaller, not only for coal but for others. This points up the oft-reiterated admonition that the completest possible data on its future necessities be submitted to the proper authorities in the War Production Board. Even now is not too late. But even if the volume available should be reduced, coal and others should be the gainers if the process of getting them is simplified, speeded up and made more positive. That is the announced goal of the Controlled Materials Plan. If it can help in no other way, that should be a substantial benefit.

FIRE

A QUICK glance at news reports leaves the impression that fires at or in coal mines have been more numerous in recent months. In most cases, as might be expected, they have been electrical in origin, with carelessness, ignorance and disobedience of instructions as contributing factors. Loss of life, fortunately, has been small, but even a small fire carries in it the seeds of a widespread conflagration with heavy casualties and wholesale destruction of producing facilities. If a distinction can be made, an underground fire is the worst because avenues of escape are limited and lack of training in what to do—the usual condition—results in confusion and errors which may have fatal results.

Preventive measures are the answer to the fire problem. It should be recognized that inflammable materials—coal, gas, timber, oil, powder, even the machinery itself—are ever present in coal mining, and that electricity usually is around to start the blaze if nothing else offers itself. In this field of prevention of electrical ignitions, there is much that can be done by the management and the electrical department with little effort and a small cost. To this can be added the bigger jobs representing a larger expense. It might be pointed out that even a heavy outlay, if it saves only one life, is well worth while.

Fires can be prevented by proper electrical construction and safeguards, continuous examination to show up hazardous conditions, installation of adequate extinguishing equipment and careful attention to other safety measures. A necessary accompaniment is education of all men in fire hazards and what to do when a fire occurs. Eternal vigilance on the part of management, supervisors and employees in removing hazards and preventing small fires which might occur from blossoming into major conflagrations should be the watchword.

CONVERT TO COAL

"WHY didn't the government store tin, manganese, chromium, aluminum, magnesium and rubber before the war? Why didn't it provide more blast furnaces and coke ovens? Couldn't it forecast anything?" The voice of the groucher is heard in the land, but, dollars to doughnuts, the critic is one who does not even sense the need to use coal, which he can get, instead of oil, that he knows he will be unable to secure in sufficient quantity to keep him warm through the winter.

The government was held up to reprehension because, with no war on hand and everybody dreading to be drawn into one, the administration did not plunge into the buying of war materials. Perhaps it should have. But, with war on our doorstep and oil already rationed, these critics are hoping to go through the winter with liquid fuel. It can't be done and no one will know it better than they when the winter cold comes over the earth. Many will have to change and coal should be on the job to help them and make them happy with their new lot.

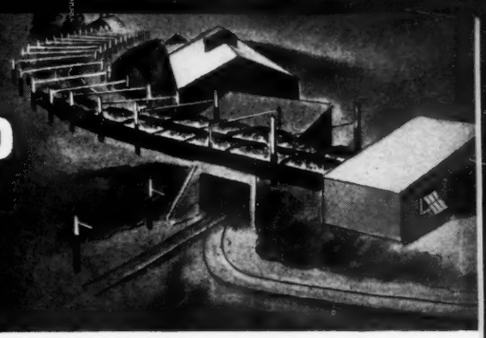
BRASS TACKS

COST of production, when one gets down to brass tacks, is a major factor in industrial progress. Coal is very much a case in point, with its great strides in this respect in recent years. Much of this progress is due to mechanical mining. But there are opportunities in other phases of mining, as the material on auxiliary pumping and aerial tramway haulage in this issue shows. Investigation will show them up.

LOAD THEM UP

PRODUCING more with the same or less daily reaches farther and farther into all activities. Electric motors are no exception to the rule. In normal times, it is the practice, for good reasons, to install electric motors with equal or slightly higher horsepower ratings than the load analysis shows, although excessive overmotoring is bad practice under any conditions. Now, it is almost a crime. Most motors can stand operation under reasonable overloads if properly applied, and that should be the guiding rule in these times. As an example, 63 lb. of material may be saved by using a 5-hp. motor for a 6¼-hp. load, for which a 7½-hp. unit normally would be installed. Careful investigation of applications and loading motors up will make a substantial contribution to the war effort.

COAL AGE NEWS ROUNDUP



Longer Work Week Held Up by Prices; Manpower Situation Gets Tighter

Inability to Get Government Assurance of Price Increases to Cover Extra Costs Prevents Appalachian Action on Longer Work Week—Rockies and Far West Granted Sunday Privilege—Anthracite Agrees on Six-Day Principle—Little Let-up Seen in Drafting

ALTHOUGH the question of price adjustments to offset the extra costs held up adoption of a longer work week in a large part of the coal-mining industry in November, a number of fields and companies reached agreements providing for working six and seven days a week, notably in the Far West. The price stumbling block, however, prevented action in the Appalachian regions with the exception of a few operations, principally those in the captive classification.

Following the action of the United Mine Workers in formally accepting the principle of the longer work week at its constitutional convention in Cincinnati in October, the first major operator-miner meeting to modify present contracts was held in New York City Oct. 27. Official participants were the northern Appalachian operators, the southern group having decided not to join with the northerners but instead to meet separately with the miners. Representatives, however, were present in an unofficial capacity, as well as representatives from the Middle West and some sections of the Far West. After preliminary exploratory discussion, the meeting was adjourned until Nov. 11 to enable the operators to gather data on the possible effects of longer working hours on costs. A further extension was found necessary, and the conference consequently did not resume again until Nov. 17.

This conference also broke up without a decision being reached, the major stumbling block being lack of definite information as to whether price adjustments could be expected from the government and, the operators' representative charged, unwillingness on the part of the miners' group to commit itself as to the actual terms of the modified agreement. This, said Charles O'Neill, spokesman for the northern Appalachian operators, left them still "in the unhappy position of not knowing what the rules are to be in applying overtime payments for overtime hours of work.

"Under the circumstances we felt, first, that the industry could not afford to accept this burden until an understanding had been reached with the government affecting ceiling prices and, secondly, we could not afford to sign a blank check on the payment of overtime until we knew what we were paying for and what we were getting for the money. The operators," Mr. O'Neill continued, "are going to try to work out this problem with the government without assistance from the United Mine Workers. The coal operators are very desirous of completing these arrangements and as practical men we are proceeding as rapidly as possible to bring it to a successful conclusion. We are going to continue to make that effort. I am authorized to say that the position taken by the northern Appalachian operators is concurred in by the southern Appalachian operators."

Local Contracts Authorized

Following adjournment of the conference, John L. Lewis, president of the United Mine Workers, announced that local district officials would be empowered to make contracts with operators' associations, groups of coal companies and individual organizations calling for a six-day week based on time-and-one-half and rate-and-one-half pay. This was deplored by Mr. O'Neill as sure to result in chaos and confusion over the terms and methods of applying the agreements.

The mine workers also announced the text of a supplementary agreement which local officials were granted authority to sign, with the proviso that no departure from the language would be allowed. Accepted by the H. C. Frick Coke Co., National Mining Co. and the U. S. Coal & Coke Co. Nov. 18, the text is as follows:

"A. The basic work week of 35 hours per individual employee shall be agreed as beginning on Monday of each week.

"B. The six-day work week is authorized, provided that all individual mine workers working in excess of 35 hours in any one week, beginning Monday of each week, shall be paid time-and-one-half or rate-and-one-half for such work, as the case may be. This arrangement shall cover day and monthly men, tonnage, yardage and deadwork rates.

"C. Holidays may be worked, provided the coal company, the district organization and the membership of the local union agree upon such holiday work. Time-and-one-half and rate-and-one-half shall be paid for all holiday work. Such payment for holiday work shall not interfere with the payment of time-and-one-half and rate-and-one-half for work done on the following Saturday in the same week.

"D. No mine workers shall be fined or penalized for absenteeism affecting Saturday or holiday work.

"This supplemental agreement, negotiated between the contracting parties signatory hereto, shall be in effect until the date of the expiration of the basic Appalachian joint agreement, namely, midnight, March 31, 1943."

Earlier in the month (Nov. 2) the United Mine Workers, which already had agreed to a six-day week, authorized Sunday work in the Rocky Mountains and on the Pacific Coast to meet the acute shortage of coal in the Pacific Northwest. "At the request of T. J. Thomas, associate director of solid fuels coordination for the war effort," said the UMW statement, "President Lewis has agreed, on behalf of the United Mine Workers, for the mines in the States of Washington, Oregon, Montana, Wyoming, Utah, Colorado and New Mexico to work Sundays in order to fulfill the coal requirements of the Pacific Northwest." Time-and-one-half and rate-and-one-half pay were prescribed for Saturday, Sunday and holiday work and union officials were requested to urge men to work the available extra days.

(Turn to page 138)

Anthracite Research Merged, With Increased Support

Operating companies representing more than 80 percent of total commercial anthracite production, based on Schedule A, have signed agreements to support a considerably enlarged research program, according to an announcement Nov. 10 by Frank W. Earnest Jr., president of Anthracite Industries, Inc. Other producers representing an additional 10 percent of the tonnage have indicated that they are considering A.I. membership.

"Immediate steps are being planned," said Mr. Earnest, "to launch the largest research program ever undertaken by the anthracite industry. An immediate objective is to develop inexpensive auxiliary equipment to improve the efficiency and convenience of equipment now using anthracite. In cooperation with equipment manufacturers, we also plan to develop, design and improve boilers, furnaces, tank heaters, stokers and other types of equipment. Through this effort the industry will be prepared to take its proper place in the post-war period with equipment to challenge all other fuels during the expected era of extensive new building that is certain to exist.

"This stepped-up research program will be in addition to the activities that our organization has been following for the last several years. Our field representatives will intensify their work in dealer assistance, which will include not only general service training but also specific help with the rapidly growing problem of converting from other fuels to anthracite. Our efforts among the heating and plumbing trades, architects, real estate and others directly and indirectly responsible for heating will be maintained.

"Advice and consultation with government agencies having to do with defense housing as well as the housing requirements of the armed forces is another important activity in our plans. Showrooms in New York, Philadelphia and Boston will continue to furnish information to both the trade and general public. No general campaign of consumer advertising is contemplated at this time."

Mr. Earnest stated that anthracite research activities at Mellon Institute and the Anthracite Industries Laboratory, Primos, Pa., were being consolidated at the latter place under the direction of H. J. Rose, senior fellow of Mellon Institute. He will be assisted by R. C. Johnson, also of the Mellon staff. War-time restrictions, Mr. Earnest said, made this revised set-up advisable because much of the laboratory's work has been in connection with the testing of equipment. Allen J. Johnson, who has been director of the Anthracite Industries Laboratory for several years, is to devote his entire time to the A.I. grate-conversion program, governmental contacts and other special assignments.

Producing companies now members of Anthracite Industries, Inc., include the following: Alden Coal Co., B and D Coal Co., Conlon Coal Co., Consagra Coal Co., Cranberry Improvement Co., DeAngelis Coal Co., Duryea Anthracite Coal Co., East Bear Ridge Colliery Co., Edison Anthracite Coal Co., Glen Alden Coal Co., Greentop Coal Co., Haddock Mining Co., Hammond Coal Co., Harry E Coal Co., Hudson Coal Co., Jeddo-Highland Coal Co., Kehoe-Berge Coal Co., Lehigh Navigation Coal Co., Locust Coal Co., Mary D Coal Mining Co., Meadowside Coal Co., Mineral Spring Coal Co., Moffat Coal Co., Morgan Coal Co., Motley Coal Co., Northwest Coal Co., No. 9 Coal Co., Otto Collieries Co., Penn Anthracite Colliery Co., Pennsylvania Coal Co., Pine Hill Coal Co., Philadelphia & Reading Coal & Iron Co., Pompey Coal Co., Repplier Coal Co., Russell Mining Co., T. F. Steele Coal Co., Stevens Coal Co., Sullivan Trail Coal Co., Susquehanna Collieries Co., Valley View Coal Co. and Jones Coal Co.

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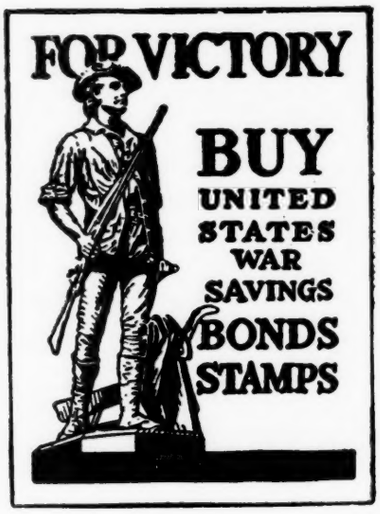
Hazard and Harlan Men Join Bituminous Coal Research

Joining the ranks of other producers of bituminous coal recognizing the need of continuous research to advance the interests of the industry, the Hazard Coal Operators' Association, with members in Hazard County, Kentucky, have voted to participate in the Bituminous Coal Research program at Battelle Memorial Institute, Columbus, Ohio.

The Harlan County (Ky.) Coal Operators' Association at its last meeting also indorsed the research program and urged producers in that field to support the work. Ten of the larger shippers in the Harlan district are now participating: Big Jim Coal Co., Clover Splint Coal Co., Creech Coal Co., Crummies Creek Coal Co., Harlan-Wallin Coal Corp., Cornett-Lewis Coal Co., Kentucky Cardinal Coal Corp., Mary Helen Coal Corp., Perkins-Harlan Coal Co. and R. C. Tway Coal Co.

More than 300 companies in 23 coal-mining districts are now subscribing to the B.C.R. program either as individual companies or as members of their local associations. Joined with them are the National Coal Association, Chesapeake & Ohio Ry., Norfolk & Western Ry. and Virginian Ry.



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New High in Coal Output Foreseen for 1943

Consumption of American bituminous coal already has reached the highest point in nearly two decades and the United Nations' drive against the Axis is expected to increase it to a new all-time peak in 1943, Solid Fuels Coordinator for War Harold L. Ickes said Nov. 17. Current statistics compiled by the Bituminous Coal Division indicate that the United States and Canada will use slightly more than 550,000,000 tons of American soft coal in 1942. Consumption, plus exports, already were approximating 550,000,000 tons for the twelve-month period prior to Oct. 1.

The Coordinator said that the mining and transportation industries must be prepared to supply approximately 600,000,000 tons of bituminous coal in 1943 in order to provide enough of this fuel to carry out planned military operations and meet essential civilian requirements. Previously, the highest soft-coal consumption was reached in 1918, when 579,000,000 tons was produced.

"We must assume that the United Nations will reach, if not exceed, their war objectives next year, and we must produce the amount of coal that will make this possible," Coordinator Ickes said. "Otherwise, there would be great difficulties in reaching these goals."

Production during the twelve months preceding Oct. 1 was approximately 573,000,000 tons of bituminous coal. Since the soft coal consumed during this period was approximately 550,000,000 tons, a large amount of coal has been made available for storage by dealers and consumers as wartime fuel insurance. This storage, now at the highest peak in history, must be increased wherever possible.

The amount of coal consumed during the twelve months prior to Oct. 1, when considered in the light of expanding war industrial activity, is one of the signposts pointing significantly to the record coal requirements ahead, he explained. The estimates of anticipated 1943 requirements are supported by strong indicators, and were based upon a careful analysis of all available data as to the amounts of steel, electrical power, transportation and other coal-consuming materials and services which will be necessary to reach 1943 war objectives.

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Zoning of Coal Condemned By Advisory Group

Declaring that zoning, allocation or rationing of coal is unnecessary, the Solid Fuels Advisory War Council early in November adopted a resolution asking Secretary of the Interior Ickes, also Solid Fuels Coordinator for War, to use his best efforts in resisting any plans in that direction by government agencies. Declaring such steps a jeopardy to orderly production and distribution of coal, the council resolved as follows:

"I. That the Solid Fuels Advisory War Council is firmly of the belief that while there exist very grave problems of manpower, equipment, etc., which are today rendering more difficult the production of coal in sufficient quantity to guarantee the necessary future supply, these problems will not be solved by, nor is there any necessity for, the adoption by the government of any rationing, zoning, allocation or other artificially restrictive program at this time;

"II. That the adoption of any such unnecessary program would disorganize and render chaotic the orderly distribution of coal, thereby making substantially more difficult of accomplishment the desired objective of supplying all the coal that is needed for our war-time economy;

"III. That the non-standard character of coal, and the varying nature of consumers' needs and equipment are such that it would be wholly impractical to apply glibly to coal rationing or allocation formulas which may have proven satisfactory for commodities of a more uniform character, and

"IV. That the Solid Fuels Coordinator for War is urged by the Solid Fuels Advisory War Council to resist vigorously any efforts looking toward the adoption by the government at this time of any allocation, zoning or rationing program for coal."

WPB Adopts Controlled Materials Plan; Mine Priority Rating Lifted

Materials Situation Gets Tighter—New Regulations Complicate Coal Problem—Controlled Materials Plan Adopted by WPB to Assure Closer Match to Demand and Smooth Out Distribution

WHILE coal mines began to feel still more the growing pinch in materials, and continued their struggle with some of the awkward features of trying to function under the Production Requirements Plan, the War Production Board in November announced its new "Controlled Materials Plan," which it states is designed to provide a better balance between the requests of users and the supply actually available. In line with their importance in the war effort, mines were given further assistance in the form of higher priority ratings for maintenance materials and supplies.

Although mining shared in receiving an AA-1 rating Nov. 11 to assure proper delivery of essential repair and maintenance materials, effective Jan. 1 for the first quarter of 1943, for keeping the nation's civilian economy in healthy condition, growing fears were expressed that materials shortages and new WPB regulations would unduly handicap coal production. Chief complaints were addressed to the fact that preference ratings given to manufacturers were not sufficient to enable them to get the necessary supplies of materials to turn out the equipment and parts, as well as to the fact that industry ratings likewise were not adequate in many cases, leaving as the only alternative the filing of supplementary PD-25F applications with no firm assurance that even this would bring the necessary ratings required to insure delivery. The fact that AA-2X ratings could not be extended by manufacturers under revised Priorities Regulation No. 11 was another source of complaint, although steps to make this possible were initiated in the Mining Branch early in the game.

Heavy cuts in the allotment of alloy steels and other essential materials in an attempt to balance total PRP allotments against total supplies were another factor in recent developments. Most of the materials used in quantity by the coal-mining industry, in fact, remained short or inadequate for both war and essential civilian uses or war use alone, according to the Sixth Material Substitution and Supply List issued by the WPB conservation division Nov. 6. Copper, practically all steel products, and many grades of lumber, as well as other metals and materials, were shown as short or inadequate.

Development of these and other situations plus the announcement of the Controlled Materials Plan focussed attention on the growing need for better presentation of coal's importance and requirements to the authorities in Washington and on the need for more complete estimates of the industry's requirements. All organizations in the industry were urged to take action similar to that of the Sinclair Coal Co., which, through W. M. Terrill, presented the case of its organization to Dr. Wilbur A. Nelson, Mining Branch Chief, WPB. Pointing out, among other things, that there is little opportunity for substitution, that every possible step is being taken to conserve materials, and that demand, much of it from war industries, is increasing, Mr. Terrill asked Dr. Nelson's cooperation in presenting coal's case to the necessary higher authority.

Anthracite Shortage Grows

Anthracite operators also expressed concern over the growing materials shortage, and on Nov. 17 Richard Maize, Pennsylvania Secretary of Mines, announced that he would join with the Butler County Coal Operators' Association in an appeal for relaxation of a ruling described as preventing mines employing fewer than 100 men from purchasing tires and gasoline for transporting men to work and from buying rubber boots.

The new Controlled Materials Plan (CMP) is intended to supplant in large part the Production Requirements Plan (PRP). It is slated to become effective in the second quarter of 1943 and to go into full operation by July 1. For the present, it is stated, mines will continue to carry on under existing Mining Branch instructions, using such ratings as the new AA-1 and AA-2X (extended Nov. 16 to cover new mining machinery when considered necessary by WPB). These are not blanket ratings, however, and can be applied only when specifically authorized. The quantity of materials to which these

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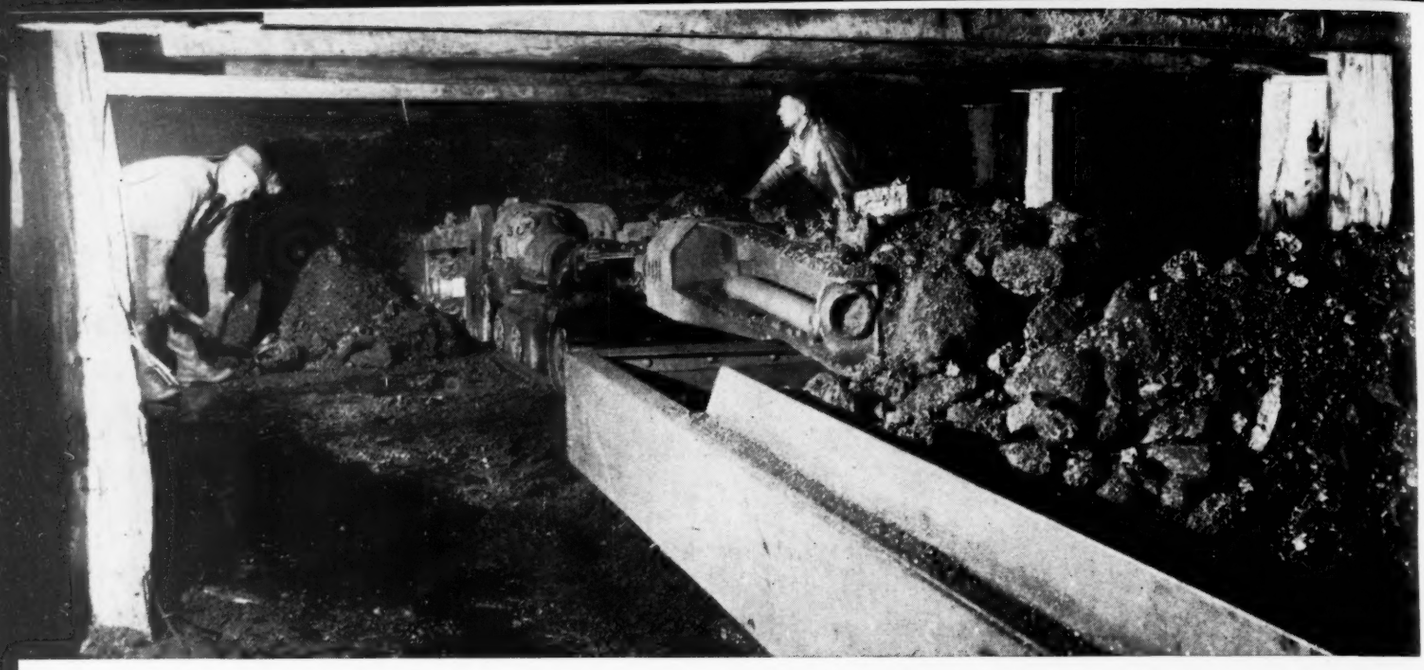


Loading in No. 5 heading. Car capacity with machine loading is 4 tons. Car sides are channels with angles on the tops.

LOADER AND 14 CARS
Get Output at Greenbrier Truck Mine

Output From One Loader and 14 Cars Running 10,000 Tons Monthly—Drawslate Averages 9 In.; Coal, 48 In.—All Cleaning Is Done at the Face—Unusual Bar-Screen Crusher Arrangement Installed

WITH one loading machine and 14 mine cars the new truck mine of the Greenbrier Smokeless Coal Co., Charmco, W. Va., shipped 45,000 tons during the first half of this year and 10,470 tons in July. Drawslate averages 9 in. and all cleaning is done at the face before or during loading. Although the mine was opened under plans for a minimum investment and the use of considerable rebuilt equipment, the two items of prime importance, loader and cars, were purchased new. The cars are all-steel construction and carry an average of 4 tons machine loaded. An unusual bar-screen and crusher arrangement is incorporated in the tipple.

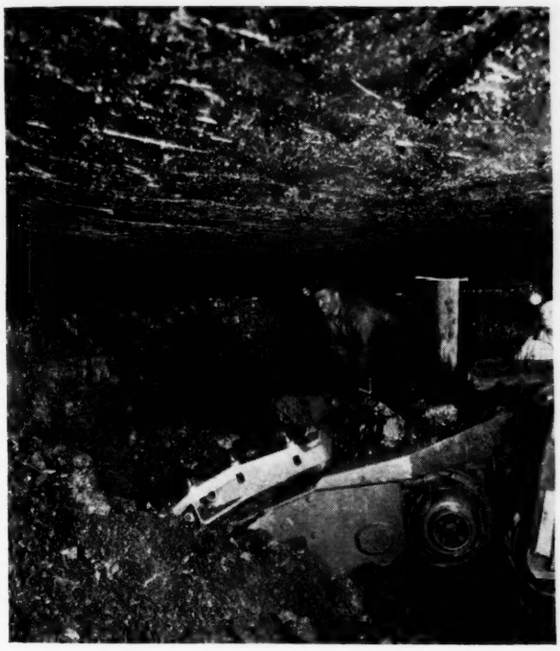
The company, a new organization with but the one mine, is headed by C. A. Hamill, of Huntington. G. D. Patterson, Rainelle, is vice president and A. W. Reese, Cinderella, is secretary-treasurer. The operation is in the Greenbrier field 1 mile up Laurel Creek from U. S. Route No. 60 and but 1,000 ft. from a paved highway. Contractors using back-dump trucks haul the coal 2.6 miles (1.6 of that on No. 60) to a ramp loading point on a siding of the Nicholas, Fayette & Greenbrier Ry., which line is leased jointly by the Chesapeake & Ohio and New York Central. The mine superintendent is J. B. Penman and the mine foreman, D. K. Chapman.

In a 1,000-acre lease in the Fire Creek seam, the mine was opened by a drift at tipple height. Seam thickness in the development to date has averaged 48 in. and has ranged from 38 to 63 in. Quality of the coal is indicated by the following data on run-of-mine shipments: 3.8 percent ash, 22 percent volatile, 2,650-deg. F. ash softening temperature, 14,800 B.t.u. and 0.83 percent sulphur. The seam is entirely free of partings and lies generally level but has many local dips presenting grades up to 10 percent. The 9-in. drawslate usually comes down when the coal is shot but occasionally may be held for one cut. The main top is quite strong and dependable, the bottom hard and the cover ranges up to 700 ft.

Inside equipment consists of the following principal items: one Goodman 112CA universal shortwall with 7½-ft. bar and standard chain using hand-forged bits; one Joy 14BU permissible loader; one Chicago Pneumatic No. 571 electric coal drill with twist augers and McLaughlin heads and bits; one 6-ton General Electric No. 823 and one Goodman 6-ton No. 8A14T cable-reel locomotives and 14 Enterprise stub-axle cars.

Construction of these cars incorporates a design idea of Mr. Hamill in that the sides are 12-in. 20.7-lb. channels, each with a 5x3x⅜-in. angle on top. Other data on these cars are: 7x13 ft. inside, lift endgate, height 27 in., back end 22 in., 48-in. gage, weight 4,650 lb., no brakes, 14-in. wheels with 18,000-lb. Timken bearings, solid wood-filled bumpers.

The mine is operated two shifts (8 a.m. to 3:30 p.m. and 5 p.m. to 12:30 a.m.) and all work to date has been confined to development, consisting of driving four 18- to 24-ft. headings abreast. At the time this article was

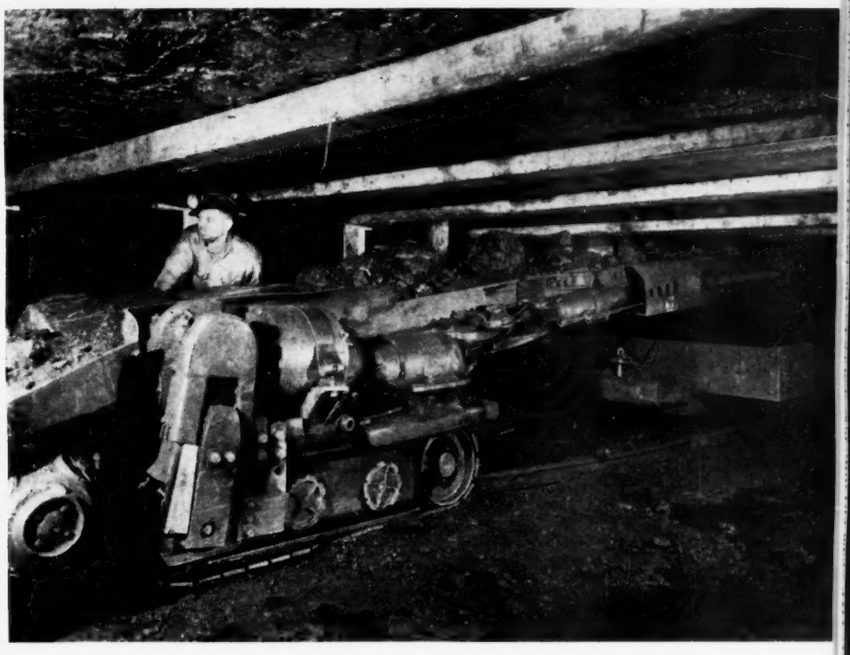


Some 10 in. of drawslate was cleaned off the top of the coal before loading started.

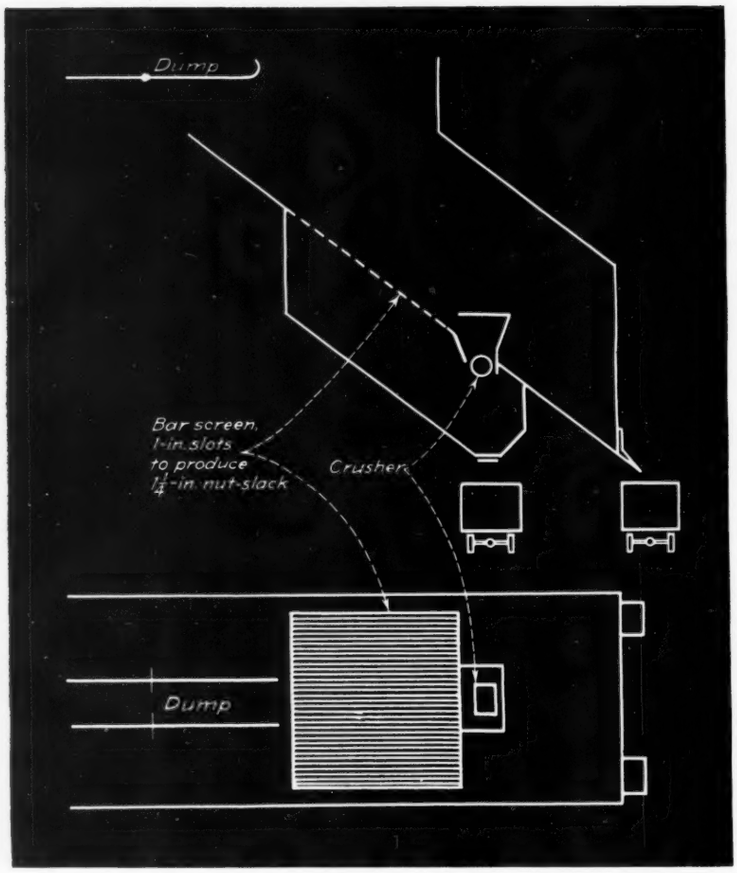
Loading from the mine-run bin.

Looking from the dump down the sloping floor of the bin. The top of the crusher roll shows in the center at the lower end of the bar-screen.

Switching cars at the portal. The dump is about 40 ft. straight ahead of the locomotive. Cars in the foreground are on a short storage track.



Loading in No. 5 heading (22 ft. wide) under firm top but with five cross-bars overhead in accordance with State Department of Mines regulations.



Plan and elevation sketches showing bar-screen and crusher installation in the center of the sloping floor of the combination dump bin and truck-loading hopper.

completed, the main entry had been extended only 1,800 ft. from the haulage portal because adverse grades encountered in the original projection required dropping back and branching off in a different direction.

In addition to the operator and helper, a Joy crew includes three and often four slate men. After the machine men have cut and drilled a place, two scrappers come in and their job includes dusting the cut and loading, as a rule, one full car by hand. After the shooting has been done (National G, permissible, 1¼x8-in. sticks and Atlas 7-ft. blasting caps) two or three slate men pry down any remaining drawslate and completely clean the top of the shot-down coal. About 25 percent of this drawslate is loaded into mine cars and the remainder is gobbed along the ribs. All slate loading is done with the loading machine. During coal loading, one of the slate crew usually stays with the machine to remove any dirt that may have been missed in the face preparation.

Measured in clean coal only, the loader performance averages somewhat over 160 tons per shift. It has been necessary to do considerable hand loading where thin coal is encountered because of a State Mines Department ruling that five crossbars must be used at the face above the loading machine. Although the coal is quite friable and few large lumps are loaded, trouble is encountered with the machine with crossbars overhead in coal less than 48 in. thick. The bars used are 3x8-in. wood, 16 ft. long.

Tracks consist of 30-lb. rail on wood ties for the main line and on steel ties (Bethlehem) for the temporary haulways. Frogs and switches were furnished by the West Virginia Rail Co. Long type steel-arcweld bonds made by the Ensign Electric & Manufacturing Co. are applied with a Guyan Machinery Co. 275-volt resistance bonder. Trolley wire is 4/0 grooved and the line materials were furnished by the Electric Railway Equipment Co. The one substation, operating from 6,600-volt a.c. purchased power and located just outside the haulage portal, is General Electric, including the Type HCC 150-kw. 1,200-r.p.m. synchronous converter with manual control panels.

Excepting a Jeffrey 18x24-in. single-roll crusher, the only other electric power used outside is that required to operate the motor of a 4-ft. disk fan. Total power consumption at the mine for the first half of 1942 averaged 2.4 kw.-hr. per ton of coal shipped.

Although practically free of gas, the mine is classed as gassy by the State department because as much as 0.5 percent methane has been detected in shotholes that have been closed and sampled. Cap-lamp equipment consists of 63 Edison units. Compensation rate for the mine was the minimum for the past year and the new rate for the coming year is again the minimum.

CRUSHER IN BIN BOTTOM

Most of the output is sold as mine-run and the remainder as crushed mine-run. The tipple and truck-loading hopper includes a bar-screen and crusher arrangement of bare simplicity and thus of low-cost construction. As indicated by the accompanying sketch and illustration, the crusher throat is in the center of the sloping floor of the lump or mine-run hopper and at the bottom of a stationary bar screen extending down from the horn dump and forming a section of the floor of that bin.

When it is desired to crush coal the two sides of the mine-run hopper are allowed to fill to the point where the coal dumped from the cars will flow to the crusher. The mine-car dump is 60 ft. straight out from the haulage portal, which is double-tracked, forming a sidetrack for the empty cars after they are dumped. Between portal and dump is a 6-ton Toledo mine-car scale.

Because of the stiff local grades and resulting heavy use of sand, the duty on locomotive tires is very severe. In the 21 months that the mine has been in operation, tires of the General Electric locomotive have been rebuilt three times and those of the Goodman twice. The filling is done by arc-welding on the job without removing the trucks from the locomotive and without any final smoothing of the tread by lathe or grinder.

The tipple, substation, mine office, including lamp room, shop and powder magazine, are the only buildings on the property. Main office of the company is at Cinderella, W. Va.

AUXILIARY PUMP

Assures Certain and Efficient Operation

Small Submerged Deep-Well Pump Feeds Mine Water to Main Pumping Unit, Preventing Leakage of Air and Cavitation — Submerging Small Unit as Helpful as More Costly Submergence of Pumproom

By H. F. BRECKER
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Shenandoah, Pa.

ESTABLISHMENT of automatic pumping at Packer Collieries Nos. 2, 3 and 4 of the Locust Coal Co., near Shenandoah, Pa., has enabled those collieries to make large savings in the pumping of mine water. This water is derived: (1) from a creek that passes over the workings, (2) from numerous crop falls to which large surface areas drain, (3) from stripping operations to the rise of the workings, which enables water to travel down them, and (4) from entrance of surface water which it has not been possible to lead away by ditches. In dry weather 1,200 g.p.m. of water is pumped to the surface, and this increases to 9,600 g.p.m. when rainfall is heavy. An average of 1,750 g.p.m., or 7.3 tons, of water is pumped to the surface per ton of coal produced.

In the Packer mines, the coal beds, which have been largely "first mined," lie on a dip averaging 35 deg. Coal is worked on four levels, on each of which a pumping plant is installed.

Fourteen centrifugal pumps are used to keep the workings free from water. Among the many improvements made to reduce pumping costs has been the installation on the Fourth Level of a large-capacity but small low-lift pump of the deep-well type driven by a 10-hp. motor which supplies water under pressure to a 1,500-g.p.m. centrifugal pump, which is automatically controlled and can discharge its water against a head of 450 ft. At present, the lift of this latter pump is from 387 to 771 ft. above tide, or 384 ft.

With the aid of the auxiliary, the main pump, which is driven by a 250-hp. motor, operates in much the same manner as a submerged pump, for in both cases the water arrives at its impeller under pressure. In the absence of provision for the submergence of the main unit, the auxiliary submerged pump assures that the efficiency of the main unit will be as great as if that submergence had been provided and at the same time adds to the capacity of the larger unit. Fig. 1 shows how the auxiliary pump is attached to the bottom of the intake line of the main pump.

A vertical 10-hp. motor drives the auxiliary pump by a shaft passing through the gland and through the interior of the suction line of that pump. As the water rises and falls within certain elevation limits, both pumps start and stop automatically. The auxiliary pump starts first and the main pump follows, and when the water drops to a predetermined level,

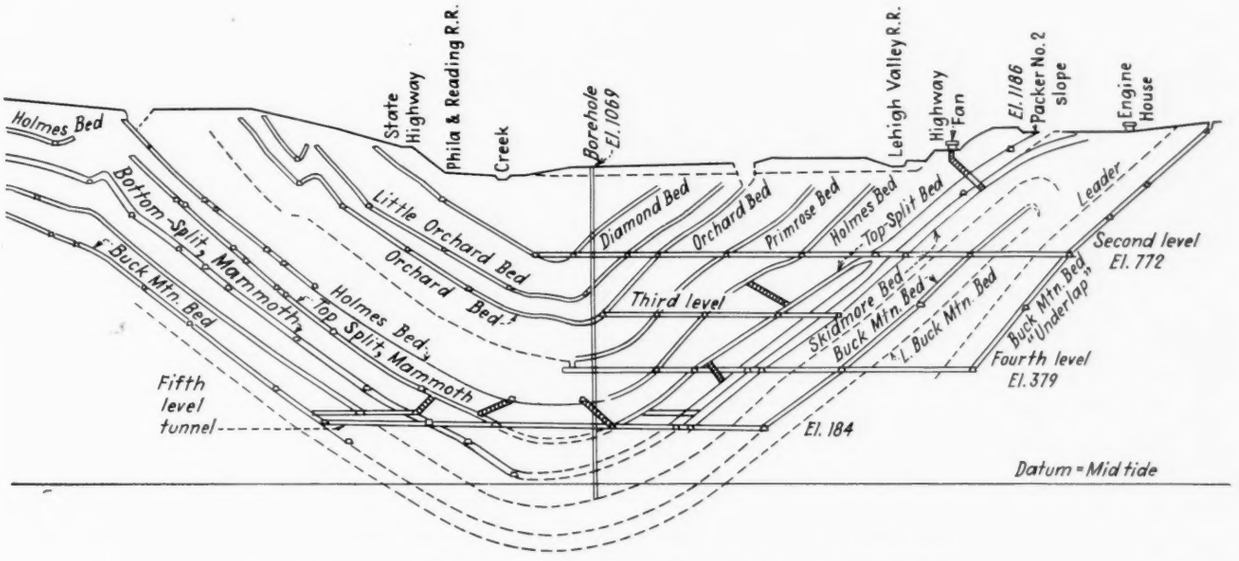

Fig. 1—Cross-section of the measures at Packer No. 2 at Mammoth Bed coal slope. Beds dip at about 35 deg. With so many being mined, much water enters.

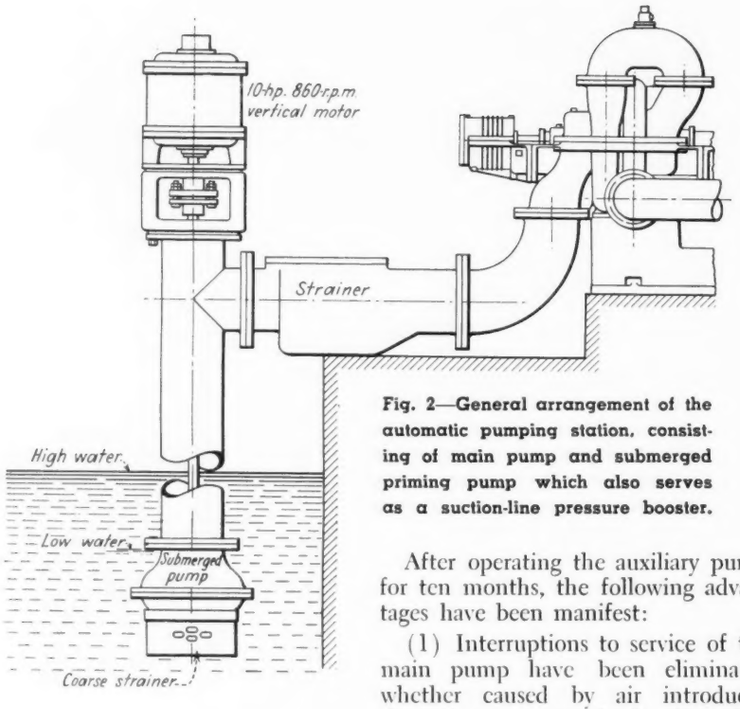

Fig. 2—General arrangement of the automatic pumping station, consisting of main pump and submerged priming pump which also serves as a suction-line pressure booster.

the main pump stops, followed by the auxiliary pump.

Started by the sump switch, the submerged auxiliary pump drives the air ahead of it, which air is released at the top of the main pump by an automatic priming valve. The main pump is started after a predetermined time interval from the starting of the submerged pump—40 seconds in this instance—during which time the air is driven out. If, after about 30 seconds, the main pump has failed to deliver water and thus has not opened the check valve in the water column, both pumps will shut down automatically. By connection with an alarm circuit, it is arranged that an alarm will be sounded should the pump fail to pick up its water, but so far it has never been necessary to sound an alarm.

After operating the auxiliary pump for ten months, the following advantages have been manifest:

(1) Interruptions to service of the main pump have been eliminated whether caused by air introduced through worn, imperfectly adjusted or neglected packing, worn shaft sleeves, blocked water-seal rings or blocked water-seal piping or a leaking suction line, for these are now under pressure and not in suction.

DETAILS OF PUMP AND AUXILIARY

Main Pump

Type:	Centrifugal
Manufacturer:	Barrett, Haentjens & Co.
Location:	4th Level, No. 2 Section, Mammoth Bed
Diameter:	10-in. suction, 8-in. discharge
Stages:	Four
Capacity:	1,500 g.p.m.
Lift capacity:	450 ft.
H.P.:	250
R.P.M.:	1,160

Auxiliary Pump

Type:	Centrifugal single-stage vertical
Manufacturer:	Goyne Steam Pump Co.
Location:	13 ft. from main pump
Diameter:	12¼-in.
Capacity:	1,750 g.p.m.
Lift capacity:	15 ft.
H.P.:	10
R.P.M.:	860

PUMPS IN PACKER COLLIERIES NOS. 2, 3 AND 4

G. P. M.	Stages	Manufacturer	On Level	To Surface or Level	Head, Ft.
		No. 2			
1—1,000	2	Barrett, Haentjens	5	4	210
1—1,500	2	Goyne	5	4	210
1—1,800	6	Goyne	5	2	597
1—1,500	4	Barrett, Haentjens	4	2	385
1—1,500	4	Barrett, Haentjens	4	2	385
1—1,100	2	Barrett, Haentjens	3	2	220
1— 750	2	Barrett, Haentjens	3	2	220
1—1,000	4	Barrett, Haentjens	2	Surface	350
1—1,500	4	Barrett, Haentjens	2	Surface	350
1—1,800	2	Goyne	2	Surface	350
		No. 3			
1—1,200	2	Goyne	7	4	390
		No. 4			
2—2,850	4	Goyne	3	Surface	465
1— 750	4	Penna	5	3	390

(2) Much less packing is required in suction and discharge glands when the auxiliary pump is provided.

(3) As the auxiliary pump operates near the bottom of the sump, the water can be pumped to a lower level than with a suction pipe, (a) without producing insufficient or even entire lack of submergence of the intake pipe, (b) without the pump receiving aerated water such as is formed and entrained when air is trapped by mine water as it falls into the sump at a nearby point, and (c) without creating whirlpools in the sump; all of which conditions carry air to the main pump and make its operation uncertain.

(4) Ability to pump water to a lower elevation is a decided advantage when silt accumulations have to be removed.

(5) Being able to keep the water in the sump at a lower elevation leaves more leeway should there occur a flood the water of which could not be removed as fast as it arrived. A nearly empty sump always is an asset should a flood occur. (However, the main pump in this instance has been left on its old foundation at the elevation of the gangway and the auxiliary pump has been placed in the sump, 9 ft. below the main pump. Under many conditions, it would be found desirable to place the main pump above the gangway.)

SUMP CAPACITY RAISED

(6) The use of the auxiliary permits the main pump to be placed above the gangway level, and under this condition, even though the gangway be flooded, the motor of the main pump or the auxiliary will not be drowned. Sump capacity is thereby made much greater than it would be if the main pump were located at the elevation of the gangway.

(7) Experience has seemed to indicate that twice as much service is obtained from the rotating element of the main pump when the auxiliary pump is provided. Of course, the addition of the auxiliary increases capacity, not only by its assistance in carrying the load but also by increasing the efficiency of the main pump, which is thus freed of cavitation.

Further, to improve pump conditions, a pipe cleaner of 5½-in. diameter was inserted in the pump column, the diameter being increased ½ in. with every pass until 9½ in. was reached. This removed a deposit of "yellow boy" (ferrous hydrate) that had made operation very inefficient.

AERIAL TRAMWAY

Is Transportation Link at Pond Creek

New Mines at Higher Level Provide More and Better Coal—Production Combined and Brought Down to Haulway Through Older Operation by Aerial Tramway—Combination Effected by Shaft and Belt Conveyor

BY J. H. DICKERSON
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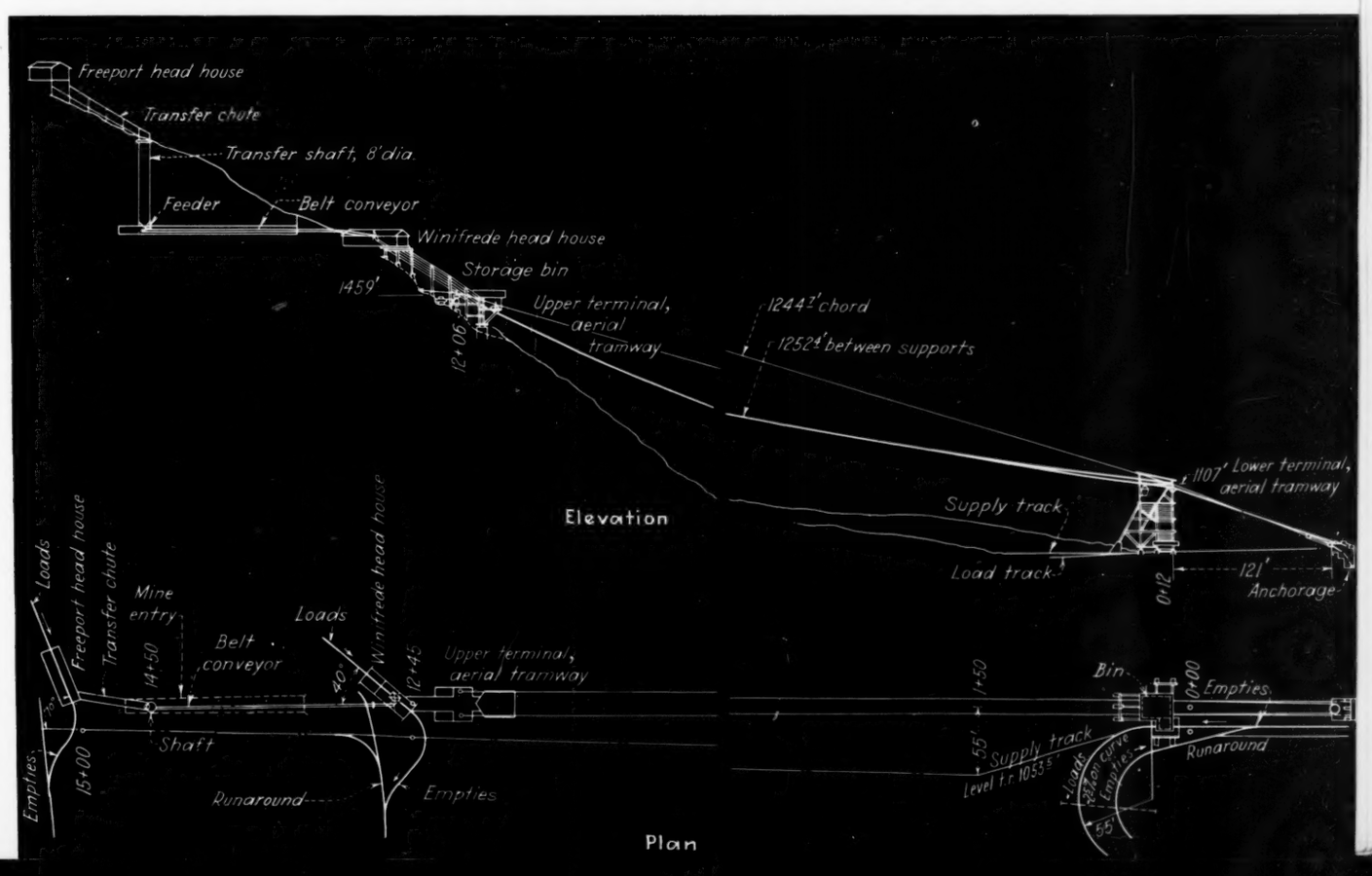
NEW MINES at the Pond Creek colliery of the Norfolk & Western Ry. in the Winifrede and Freeport seams utilize a transfer shaft and aerial tramway to reload the coal into mine cars for haulage three miles through the old Williamson-Thacker seam mine to the original headhouse. From there it is lowered by rope-and-button conveyor to the Pond Creek seam level and then taken by belt to a point from which it either goes by another belt to railroad cars or by a second aerial tramway crossing the Kentucky-West Virginia line to a locomotive coaling station in the Williamson (W. Va.) yard.

The original mine, near the mouth of Pond Creek, was purchased by the railroad in 1920 and at that time the conveyors from headhouse to coaling station were installed. The aerial tramway, which crosses a public highway, Pond Creek, Tug River and several railroad tracks, saves an estimated 50c. per ton compared to delivery to the coaling station bins by railroad car and hoist. The latter would require shifting cars across busy yards and across main-line tracks and would take an hour of hoisting. Capacity of the bins in this coaling station is 1,500 tons and on busy days over half that quantity is dispensed to locomotives.

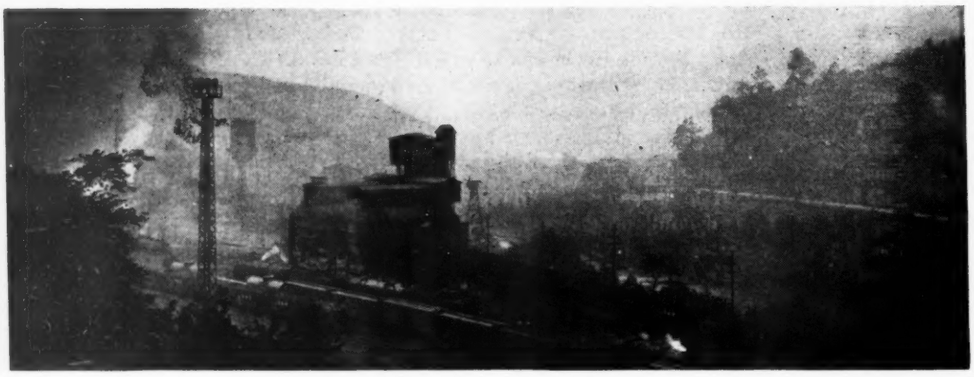
Prior to opening the new mines, the production came from the Williamson-Thacker and Pond Creek seams, which are lower in the series. Because of a limited acreage available to begin with, production for some years was restricted to a tonnage insuring keeping the coaling station supplied. Only enough railroad cars were loaded to make a full day's run after the station was filled. When more acreage was acquired, tonnage was increased, permitting more economical operation. Because the Williamson-Thacker and Pond Creek seams here average only about 40 in. and contain impurities, they hardly could be operated as commercial mines without the savings due to the coaling station.

Overlying part of the areas under

Fig. 1—Layout of aerial tramway serving two new mines on Turkey Creek.



Crushed coal making its final journey to the coaling station via aerial tramway.



Coaling station and part of yards with Tug River in the background.

Lower terminal of the aerial tramway serving the new mines, with the upper terminal and the two headhouses on the mountain in the rear.

lease are the Winifrede and Freeport seams, the former 500 ft. above the Thacker and the latter 125 ft. higher. Based on experience at other mines, it is deemed inadvisable to draw pillars in the lower seams when there is valuable coal above, even with the 500-ft. interval. That restriction, plus a superior and thicker coal, led to plans for working the Freeport and Winifrede acreage carrying 3,500,000 tons of coal.

These two seams average about 5 ft. each of hard, blocky, free-burning, high-volatile coal with a small quantity of fines, low ash and low sulphur. It crushes to a fairly uniform size for stoker fuel, which is used on all locomotives except a few pulling local trains and those serving as yard engines. Heating value, although under that of Pocahontas coal, is fairly high. Those characteristics, plus a small percentage of fines, which means low stack loss under forced draft, make it a superior fuel for locomotives.

Close to 100 percent recovery has been attained in the mining in the Pond Creek and Williamson-Thacker seams because hand-loading is employed and thus allows drawing all pillars.

Portals of the new mines are on Turkey Creek, which is across the hill from the tipple and tracks on Pond Creek. Equipment was brought from a mine at Vulcan, W. Va., which the railroad company worked out. This includes an aerial tramway installed at Vulcan in 1912. With some slight repairs it serves as well as new equipment. The frame structures were heavier than usual for aerial tramways, but they required practically no replacements, and similar construction was used for the new plant on Turkey Creek, which will have somewhat heavier loading and possibly a longer life, as more Winifrede coal is available and other leases limit the output from the new mines.

A general plan of the outside equipment for the new mines is shown in Fig. 1. At the lower terminal bin of the aerial tramway the coal is transferred to mine cars a little above the Thacker level. From there the haul to the tipple is three miles, but the track is laid with 80-lb. rail, which permits unusually fast running with very little track maintenance. It is expected that this long haul will be more than offset by cheaper royalty and mining in the top seams, and the coal is of higher quality. The bin holds over 100 tons and cars are loaded between trips, so there is little lost time in actual haulage. Cars from the Winifrede seam will be dumped into the upper terminal bin, which has a capacity of 100 tons. Very little tonnage will come from this seam until the Freeport has been worked for two years.

To bring coal from the Freeport dump to the upper terminal bin a rope-and-button conveyor was considered, but war conditions made delivery uncertain and only 800,000 tons was available, so a cheaper installation was sought. The profile of the hill and the vertical interval were not favorable for an outside chute. After careful consideration it was decided to put down a shaft from the Freeport dump to the Winifrede seam and bring the coal out of an opening in the Winifrede seam over a belt conveyor. The company had a feeder and belt conveyor available and almost all equipment necessary for the new plant.

In making the layout it was found desirable to bring the coal part way down the hill to the shaft. The chute will hold 50 tons of coal and the shaft 100 tons so that cars may be dumped and returned to the mine quickly. Coal may be left in the shaft without danger of freezing. Ordinarily there will be coal standing in the shaft, but most of the coal will be crushed at the tipple, and the coal is so hard that there never will be an objectionable quantity of fines. At other mines shafts have been used to transfer coal from this seam and no attempt has been made to keep any coal in them. The difference is hardly noticeable with this coal, but if lump were desired it probably would be well to keep the shaft nearly full. So much handling would not be recommended for a soft friable coal.

ARMATURE PROGRESS

Reflected in Long-Term Detailed Records

Individual Records on 173 Armatures in 125 Equipment Units Cover 1,384 Armature Years — Better Design and New Maintenance Methods and Materials, Plus Careful Workmanship, Cut Armature Rewinds

ITEMIZED records are of great service in pointing the way to better methods and lower costs. The individualized record of service and rewinds on 173 armatures in 125 items of coal-mining equipment at Zeigler No. 1 mine, Bell & Zoller Coal & Mining Co., Zeigler, Ill., with which this article deals, is something not often seen. It indicates the improvement in armature life to be expected from improved or modern insulating materials and painstaking workmanship.

To be exact, the record covers 1,384 armature years. It begins with 1929, when all coils were cotton-insulated, mica being added occasionally. The five-year period beginning with 1930 is omitted. In 1935, the use of asbestos-insulated coils was begun and in September, 1939, a switch was made to glass-insulated coils, which is 100 percent the practice to this date.

The equipment included in this record consists of 48 mining locomotives, 30 cable reels, 26 coal-cutting machines and 21 crawler loading machines. Table I is the itemized list. Table II shows the rewinding record, the figures indicating which type of equipment gets the most abuse and, perhaps, that which has had the most attention in design.

Although not necessarily a true picture of the downward trend of rewinds and possible final achievement, Fig. 1 does give an accurate view of what happened and indicates future possibilities. Fig. 2 blocks out the four types of equipment so that the complete record may be taken in at a glance. It indicates clearly that improvements in locomotive armature life lagged behind that of other types of mining electrical equipment. A possible reason is that locomotive motors up to 1929 had received more attention from the design standpoint than any other mining motors. There was, therefore, not as much room for improvement as with other equipment where competition had not been so keen. So, less improvement in armature life was to be expected until the advent of asbestos and glass insulation and better varnishes.

Another explanation is due in the case of cable-reel armatures. In the period 1929-35, the type of winding was being changed from ring winding, in which the wire had to be threaded round and round, to factory-made form-wound coils. This reduced burnouts very materially. Still another cable-reel improvement at this mine was the introduction of a two-step reel resistor which reduced the reel cur-

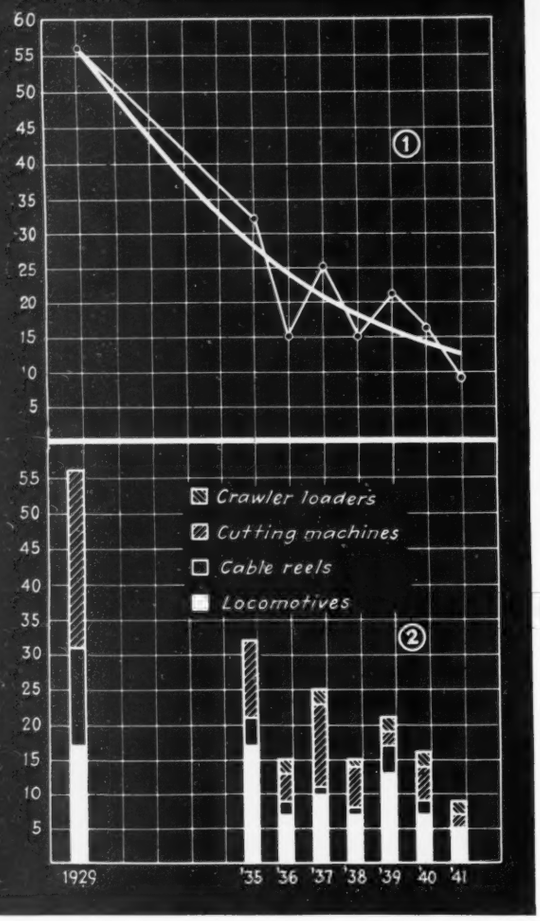


Fig. 1—Armature rewinds in eight years.
Fig. 2—Rewinds by equipment units.

rent while the cable was paying out. Coil heating was much reduced and armature life extended.

In the development period, which still goes on, cutting machines and their motors were undergoing improvements in machine and motor design aimed at larger production and less loss of power in the machine, as well as better coils. Among the mechanical helps in design has been the extensive use of ball and roller bearings.

Finally, more careful workmanship at this mine has been responsible for much of the increased life of armature coils. That is one of the musts if armature life is to be extended. A lathe suitable for tight banding is a part of the shop equipment. The same winder on the job for many years, in the person of Andrew Forkotich, contributes to the success of this branch of maintenance. Still another factor is the fact that no change in mine management took place over these 13 years. Lee Haskins was superintendent and Ernest Prudent was chief electrician while this record was made. Upon Mr. Haskins' retirement after 54 years of mining, he was succeeded in 1942 by Mr. Prudent.

TABLE I—EQUIPMENT AND ARMATURE LIST

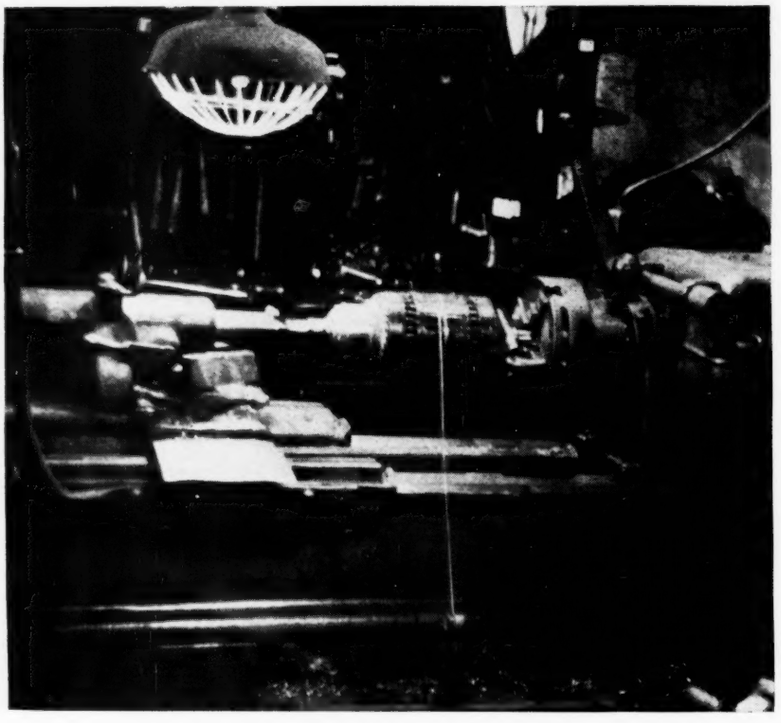
Number		Weight	Armatures Type	Armatures No.
4	Goodman locomotives	8-ton	32-A	8
1	Goodman locomotives	13-ton	29-A	2
5	Goodman locomotives	15-ton	36-A	10
11	Westinghouse locomotives	6-ton	WH-60	22
2	Westinghouse locomotives	13-ton	WH-115	4
3	Jeffrey locomotives	4-ton	Ring wd.	6
6	Jeffrey locomotives	6-ton	MH-85	12
1	Jeffrey locomotives	6-ton	MH-100	2
10	Gen. Elec. locomotives	6 & 8-ton	HM-819 / HM-821	20
2	Gen. Elec. locomotives	5-ton	HM-803	4
3	Mancha battery locomotives	6-ton	C61-6	6
30	Gen. Elec. reel motors		CY-21	30
10	Joy loading machines	11-BU	Rel. 266-J	10
8	Joy loading machines	5-BU	Rel. 265-J	8
3	Joy loading machines	35-KT	C-W	3
20	Jeffrey cutting machines	.....	35-B	20
6	Jeffrey cutting machines	.....	35-BB	6
125				173

TABLE II—ARMATURE REWIND RECORD

	Rewinds	Rewinds per Armature			
		1929	Eight Years	Seven Years	1941
8 Haulage locomotives	12	0.50	0.75	0.25	0.00
40 Gathering locomotives	71	0.112	0.887	0.775	0.062
30 Cable reels	28	0.446	0.932	0.466	0.00
26 Cutting machines	66	0.960	2.536	1.578	0.077
Joy loading machines	21	.....	.....	0.570	0.095
Total equipment	189	0.324	1.09	0.779	0.052

TABLE III—LOCOMOTIVE ARMATURE RECORD

Make	Number	Armatures Rewound Total	Per Loco. Eight Years	Per Loco. Seven Years
A	10	18	1.8	1.1
B	13	27	2.08	1.62
C	10	13	1.30	0.90
D	12	17	1.42	1.42
E	3	7	2.33	2 33



Special armature banding lathe at Zeigler No. 1 mine.

OUTPUT PER MAN-SHIFT

Rises With Seam Thickness in W. Va.

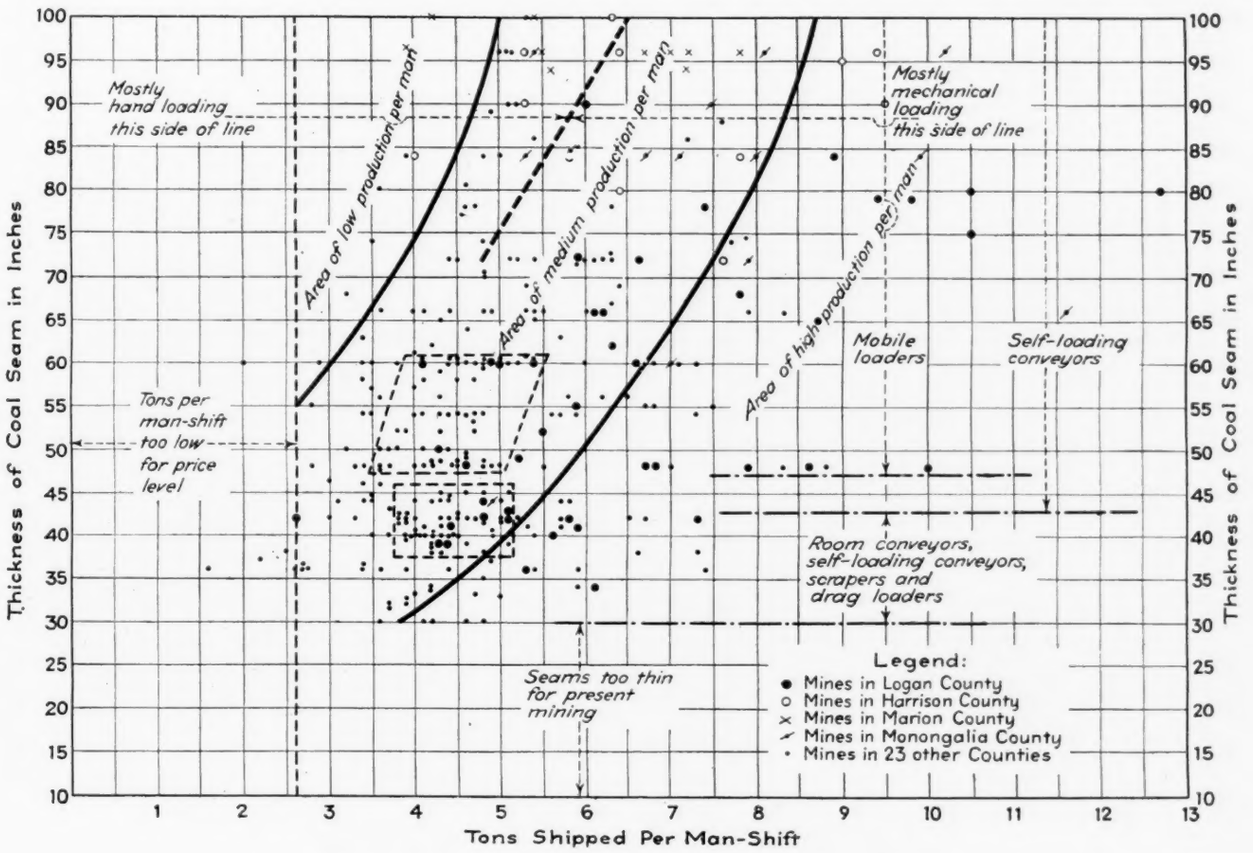
Production per Man-Shift Rises Rapidly in Seams Over 40 In. at West Virginia Mechanical Mines—Performance in 30 In. as Good as in 40—Range Nearly 300 Percent in 80-In. Coal

MANY West Virginia operators have made use of data in the monthly report of the Department of Mines of that State to compare their performance with that of other mines known to have approximately the same conditions. Such comparisons naturally are a major incentive toward studying the operation to see if lower efficiency, where such is the case, is excusable because of natural difficulties or is due to conditions which can be corrected. To afford an over-all picture of the performances of the mines of the State the accompanying pattern graph has been prepared. Tons per man-shift were derived from the West Virginia "Monthly Report, Coal Mine Section, April, May, June, 1942," giving data for the first six months of the year, and the seam thicknesses for the corresponding mines are from the 1942 Keystone Coal Buyers' Manual (McGraw-Hill Publishing Co., Inc.).

Tons shipped per man-shift, one coordinate of the chart, were calculated from Table No. 3 of the West Virginia report by dividing production in tons (January to June, 1942, inclusive) by "average men" and dividing that result by "days." A note at the end of that Table No. 3 explains that "Employment does not include general supervision, store employment, house repairmen or coke workers."

Data for 333 mines are included in the graph and the 28 counties represented are listed in Table II.

Evident on the graph is the expected increase in production per man-shift with increasing thickness of seam. It so happens that in the range of 40 to 55 in. the production figures in tons average approximately one-tenth of the seam thickness in inches


Thickness of Coal Seam in Inches
Tons Shipped Per Man-Shift
Mostly hand loading this side of line
Mostly mechanical loading this side of line
Area of low production per man
Area of medium production per man
Area of high production per man
Tons per man-shift too low for price level
Mobile loaders
Self-loading conveyors
Room conveyors, self-loading conveyors, scrapers and drag loaders
Seams too thin for present mining
Legend:
Mines in Logan County
Mines in Harrison County
Mines in Marion County
Mines in Monongalia County
Mines in 23 other Counties

Pattern graph of performance in West Virginia mechanical mines in terms of tons per man-shift in relation to seam thickness.

As an example, the average for mines in 40-in. coal is about 4 tons per man-shift and in mines in 50-in. coal about 5 tons. The graph also shows 8 tons approximate average for 80-in. coal.

The two curved lines were placed in accordance with the apparent pattern to indicate three performance areas: low production per man-shift, medium, and high production per man-shift. Because natural difficulties, such as excessive gas, excessive water, steep grades, bad top, parting and drawslate, have not been taken into consideration, a number of mines, if the figures were adjusted, probably would fall farther to the left. Only that type of adjusted diagram, also, could come near to evaluating the managerial factors involved in getting the highest possible output per man-shift.

Few mines in the State produce less than 2.5 tons per man-shift. The minimum on the chart is 1.6 Above 2.6 tons per man-shift, mines in considerable number can stay in business and this base is shown by a line of demarcation in the chart. Nine mines fall in the low-production area beginning at 2.6 tons in seams over 55 in. and extending to 5 tons in 100-in. coal. The high production area, which includes 66 mines, begins at 3.8 tons in 30-in. seams and 8.7 tons in 100-in. seams. Nineteen of those 66 mines are in Logan County, five in Monongalia and four in Harrison County. Those three counties and the County of Marion lead in tons of coal loaded mechanically. Mines of those four counties are indicated by different symbols on the graph.

In the broad general area of medium production per man, the rectangle outlines a small area in which 59 mines are concentrated. This is bounded by thicknesses of 37 to 45 in. and productions of 3.7 to 5.2 tons. The area just above includes another concentration of 62 mines. Its boundaries are 44 to 61 in. and 3.5 to 5.5 tons.

Horizontal lines at the right of the graph define, at 43- and 47-in. seam thicknesses, the apparent general limits of application of the several methods of mechanical mining to date in West Virginia. The 47-in. lower limit for mobile loaders is open to debate. Among the factors affecting this limit are: (1) degree of adherence to a ruling of the State Department of Mines calling for placing five crossbars over the loading machine, (2) size of lumps loaded, and (3) frequency of encountering low spots and extent of this variation from average seam thickness.

Many of the mines in coal over 85 in. thick are in the Pittsburgh seam, where 12 in. or more of top coal is left in place. Few of them recover over 85 in. of coal and therefore the graph symbols for those mines could very well be moved down to that line.

Obviously, when the tons per man-shift for specific mines are being compared with the graph an adjustment of seam height should be made if a thick parting or drawslate is handled. For instance, if the total thickness of the seam is 58 in. and an 8-in. parting is handled it should then be more representative to locate the mine on the 50-in. line of the graph. There is room for an argument over the contention that at least double the parting thickness should be deducted if the graph points were to be adjusted. The rebuttal is that the new position would compare the mine with others in 42-in. seams, which is not entirely fair because the 58-in. seam mine can use mobile loaders and the 42-in. seam property usually would find a similar practice difficult if crossbars were required.

TABLE II—WEST VIRGINIA COUNTIES REPRESENTED ON GRAPH

	Number of Mines	Range of Tons Per Man-Shift
Barbour	8	4.8 to 6.0
Boone	15	3.7 to 7.9
Brooke	6	3.6 to 7.3
Clay	2	4.8 to 5.2
Fayette	38	2.5 to 6.8
Gilmer	1	3.3
Greenbrier	8	4.2 to 8.3
Harrison	12	5.3 to 9.5
Kanawha	22	2.9 to 6.3
Logan	42	4.1 to 12.7
Marion	11	5.5 to 8.8
Marshall	2	5.3 to 5.5
McDowell	39	2.7 to 8.8
Mercer	9	3.2 to 5.7
Mineral	1	3.4
Mingo	13	4.1 to 6.7
Monongalia	14	4.8 to 11.6
Nicholas	1	3.7
Ohio	5	2.0 to 4.8
Preston	8	3.2 to 4.6
Putnam	1	3.6
Raleigh	47	1.5 to 7.9
Randolph	3	2.2 to 4.7
Taylor	2	3.9 to 5.1
Tucker	5	3.5 to 5.2
Upshur	2	4.8
Webster	3	4.2 to 5.7
Wyoming	13	3.4 to 7.5
Total	333	

TABLE I—DATA ON FOUR WEST VIRGINIA COUNTRIES LEADING IN MECHANICAL MINING, JANUARY TO JUNE, 1942, INCLUSIVE

Logan—10,551,913 tons; 5,466,834 tons loaded mechanically; 2,024,103 tons hand-loaded onto conveyors.

Individual Mines on Graph			
Seam Thickness, Inches	Tons	Days	Tons Per Man-Shift
60	60,354	98	4.1
55	371,114	123	5.9
48	104,078	116	4.6
48	213,735	151	8.6
60	84,308	124	5.0
36	68,972	134	5.3
42	190,128	113	7.3
42	53,126	99	2.6
40	132,942	120	5.6
52	158,692	142	5.5
50	56,584	119	4.3
65	226,999	127	8.7
72	171,132	110	6.6
72	356,004	120	5.8
66	109,958	147	6.1
66	175,887	127	6.1
80	440,441	120	10.5
79	652,696	124	9.8
78	94,293	110	7.4
79	400,609	118	9.4
68	92,839	107	7.8
80	462,404	121	10.5
80	532,829	110	12.7
84	526,225	120	8.9
48	63,300	85	7.9
60	227,710	109	6.6
48	122,173	123	6.8
42	140,177	99	4.8
42	363,549	127	5.8
34	160,392	110	6.1
39	66,821	128	4.3
48	177,717	123	6.7
41	76,960	117	5.9
48	82,410	112	10.0
60	97,809	105	5.4
42	73,219	119	4.4
90	427,635	127	6.0
44	471,447	122	4.8
60	110,239	112	4.9
49	111,966	146	5.2
42	121,103	125	5.1
62	292,799	129	6.3

Marion— 5,996,968 tons; 3,085,804 tons loaded mechanically.

96	18,982	91	3.9
94	193,442	115	7.2
94	478,202	130	5.6
96	704,229	119	6.7
96	448,993	129	7.2
96	153,268	152	5.5
96	975,270	124	7.0
96	694,934	124	7.8
78	1,007,636	147	8.7
102	116,380	129	4.4
102	146,002	129	5.4

Monongalia—5,744,293 tons; 5,002,502 tons loaded mechanically.

84	390,249	152	9.9
72	547,029	143	7.9
84	190,846	127	8.0
96	685,029	131	10.2
96	644,781	149	8.1
96	70,101	51	5.4
66	70,160	108	11.6
44	345,387	129	4.8
84	42,621	131	5.3
90	188,310	128	7.5
60	348,023	150	7.0
84	380,783	150	5.8
84	286,299	146	7.1
84	17,865	72	6.7

Harrison—3,196,375 tons; 2,080,339 tons loaded mechanically; 56,034 tons hand loaded onto conveyors.

96	196,827	143	6.4
90	240,344	130	5.3
84	54,732	93	7.8
80	48,871	124	6.4
84	41,590	118	4.0
96	21,123	77	5.3
84	2,314	22	5.8

WAR-TIME SAFETY

RIGHT SAFETY OUTLOOK

More Essential Than Ever in Coal Mining

New Men, Pressure for Tonnage and Reversion to Wrong Attitude Can Cancel Safety Gains — Maintaining Safety Spirit Even More Vital Under War Conditions—Plant Defense a New War-Time Responsibility

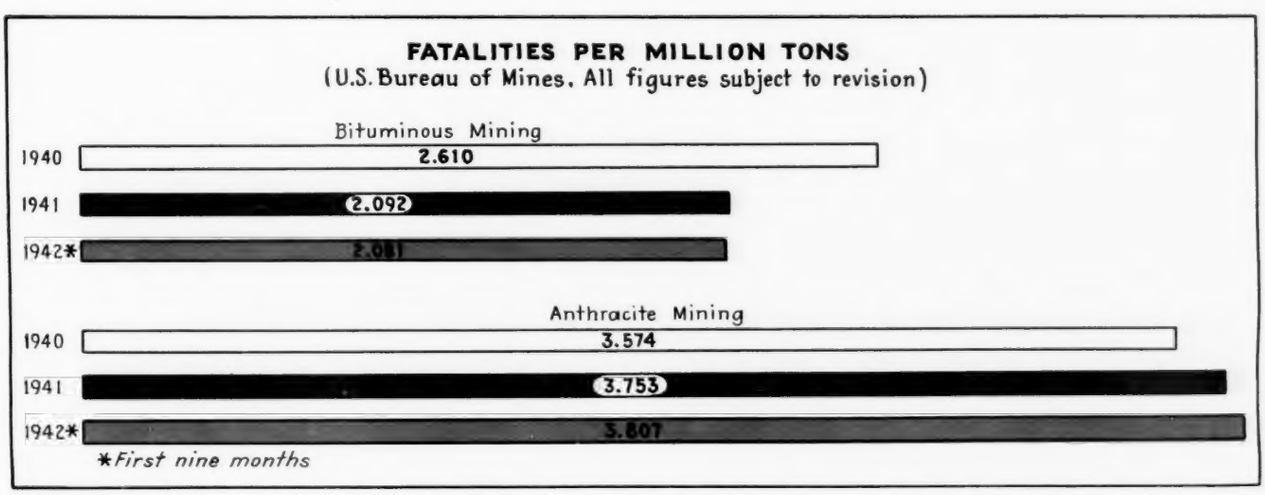
WHAT is the outlook for safety in coal mining under war-time conditions? That question is a matter of growing concern to many in the executive, supervisory and safety groups. The disturbance growing out of war, unless the proper measures are taken, foreshadow a rising tide of injuries and fatalities with consequent burden on available manpower, not to mention the other penalties which inevitably accompany loss of life and limb and destruction of property resulting from coal-mine accidents.

For the bituminous industry as a whole, on the basis of figures subject to revision, the record still looks good—at least on the surface. In the first nine months of 1942 the death rate per million tons mined stood at 2.081, compared with 2.092 in the year 1941 and 2.610 in 1940. This reflects the fact that many organizations, such as the Union Pacific Tool Co. (see p. 73), by increased pressure on safety, have been able to offset the handicaps of large numbers of new employees and other adverse factors growing out of war-time dislocations in normal mine operation.

That similar steps must be taken throughout the industry if a rise in accidents is to be prevented is indicated by the records of other companies. A growing number are taking these steps.

Anthracite has not fared quite so well as bituminous mining, although in some respects, particularly from the standpoint of replacement of workers, it apparently has not yet suffered to the same extent as soft coal. The anthracite fatality rate (figures subject to revision) was 3.807 per million tons mined in the first nine months of this year. The rate in 1941 was 3.753; in 1940, 3.574.

The factors tending to increase accidents in coal mines, unless countermeasures are taken, are several. One, already mentioned, is new men. Another is increased pressure for production. A third, and perhaps most important of all, is a tendency to revert



FATALITIES PER MILLION TONS BY CAUSES

(U.S. Bureau of Mines. All figures subject to revision)

** First nine months*

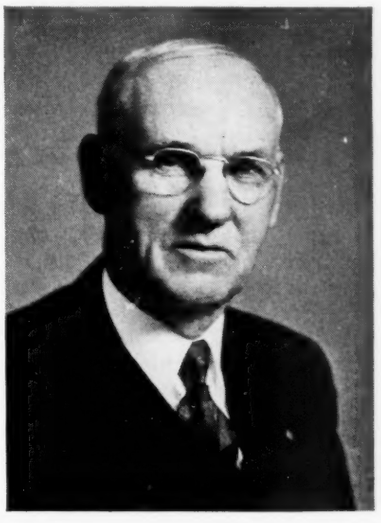
to the wrong mental attitude. This results, among other things, from the pressure for tonnage, preoccupation with personal problems growing out of the war and, in the face of wholesale death and destruction, a tendency to lose sight of the fact that a death or injury on the home front is a thing to be avoided now more than ever.

What can be done to hold and extend safety gains and conserve manpower and producing facilities would, in all its details, take many pages. The problem, however, boils down to the basic principle that safety cannot be had without the creation and maintenance of a safety outlook. That theme recurs throughout the material which follows in this section. All men engaged in mining must be safety-conscious, including executives and supervisors. When that spirit prevails, it automatically follows that all the necessary physical safeguards will be taken, that care will be devoted to breaking in and training new men, including instilling them with the safety habit, and that all hands will do their utmost to work efficiently without injuries and fatalities.

Where to attack, once the proper safety spirit is assured, of course is all along the line. The few big causes of injuries and fatalities, however, still are very much with us. These are: falls of roof and coal, haulage and explosions. Falls of roof and coal retain their commanding lead, accounting for 1.007 deaths per millions tons mined in the bituminous industry in the first nine months of 1942, compared with 1.155 in 1941 and 1.127 in 1940. The anthracite death rate from falls of roof and coal was 2.289 in the first nine months of 1942, 1.951 in 1941 and 2.040 in 1940.

Along with safety and normal plant protection, coal mining, like all other American industries, now has the additional duty of protecting its personnel and producing facilities from hazards directly related to war. These hazards include spying and sabotage. The possibility of such may seem remote in many cases, but it still is a possibility. Protection against such hazards therefore should be included in the wartime planning of all coal-mining operations. How one company, Lehigh Navigation Coal, has handled the problem is the subject of a pithy, factual supplementary article in this war-time safety section.

NEW MEN
Throw Heavier Burden On Safety Organization



More Supervisors, Special Training and Intensified Study of Corrective Measures Among Steps Taken to Meet Problem of Large Influx of New Men—and Women

By EUGENE McAULIFFE
President, Union Pacific Coal Co.
Omaha, Neb.

WHILE the labor problems of the Union Pacific Coal Co., operating eight mines in the State of Wyoming, are perhaps no more serious under existing conditions than those of the average coal-mining property, we have been much concerned with the continuance of our rather satisfactory mine safety record. This concern results from the employment of a very large number of new and inexperienced men in the last year. However, perhaps wholly by the grace of God, we are maintaining our safety performance, and achieved a figure of 147,133 man-hours of exposure per lost-time accident for the first ten months of the current year, the record for the same period in 1941 being 145,554 man-hours per lost-time accident.

We are maintaining our system of physical examination, including eye examination, before the men are employed, and each man, as heretofore, is required to wear a hard hat, hard-toed shoes and safety goggles while on duty.

From Jan. 1 to Oct. 17, inclusive, we have employed 2,029 new men, suffering 2,002 separations during the same period. Our total mine-worker force on Oct. 17 was 2,773 men and 25 women. Thirteen women are picking out impurities on the tipples and twelve are working as apprentices in the machine shops.

We have reinforced our supervisory staff, putting on night general foremen and a second general safety inspector. We also have added to our unit foremen personnel, and when a new man is brought into the mine he is placed in a crew with experienced men and given several weeks' training before he is in any sense put out on his own.

Our Greek letter safety society, Sigma Tau Epsilon, has rendered marked assistance in studying and recommending corrective measures. The society meets quarterly and haulage accidents were the principal subject of the last meeting, held Oct. 11. Reduced to a few words, we are doing all we have heretofore done to win the Sentinels of Safety trophy six times, plus much that is new.

PLANT DEFENSE

Handled by Special Organization at L.N.C.

Spying and Sabotage Guarded Against by Enlarged Patrol and Police Organization — Plant Studied to Discover and Protect the Vulnerable Points — Supervisor and Employee Cooperation Enlisted in Project

By H. S. GILBERTSON
Director of Personnel
Lehigh Navigation Coal Co.
Lansford, Pa.

AFTER Pearl Harbor, the Lehigh Navigation Coal Co. took steps to guard against being caught napping by spies and saboteurs. The danger may be remote, but who can tell? Anthracite is recognized as a vital war industry. Federal agencies have especially urged all such industries to guard against theft of and damage to materials, precision tools, blueprints and other confidential data, substations, transmission lines, etc., through fire or any other means.

A special organization was set up under Capt. Charles Stanley, who has headed the agency which has policed the company properties. Mr. Stanley has had long experience in both industrial and public police work, having been Chief of Police at Tamaqua, Pa., and a member of the Pennsylvania State Police. In World War I he served in France with the U. S. Marines. For the special requirements of war times his force was enlarged from four to eleven men, which provides the personnel for over-all mobile patrol duty 24 hours a day.

H. S. Gilbertson

In addition, every colliery set up a local armed guard organization under a chief guard which also is on duty around the clock. The police unit and the colliery guards form a complete organization under Mr. Stanley, who has full authority to pass on the selection of colliery guards and exercise discipline over them.

All operating and staff departments are enlisted in special services of war defense, including the mechanical, electrical and medical personnel. At each colliery, the superintendent is the coordinator and the outside foreman is his assistant.

It happens that the company's physical equipment, set up in peace times, is well designed to meet war conditions. This is notably true of the principal fans, which in many cases are located at isolated points. Each of these fans is housed in a fire-resisting building and is surrounded by a 6-ft. chain-link fence with barbed-wire extensions. The main fan systems are automatically and remotely controlled, are provided with bearing signals which register at the substations, and are serviced by telephones.

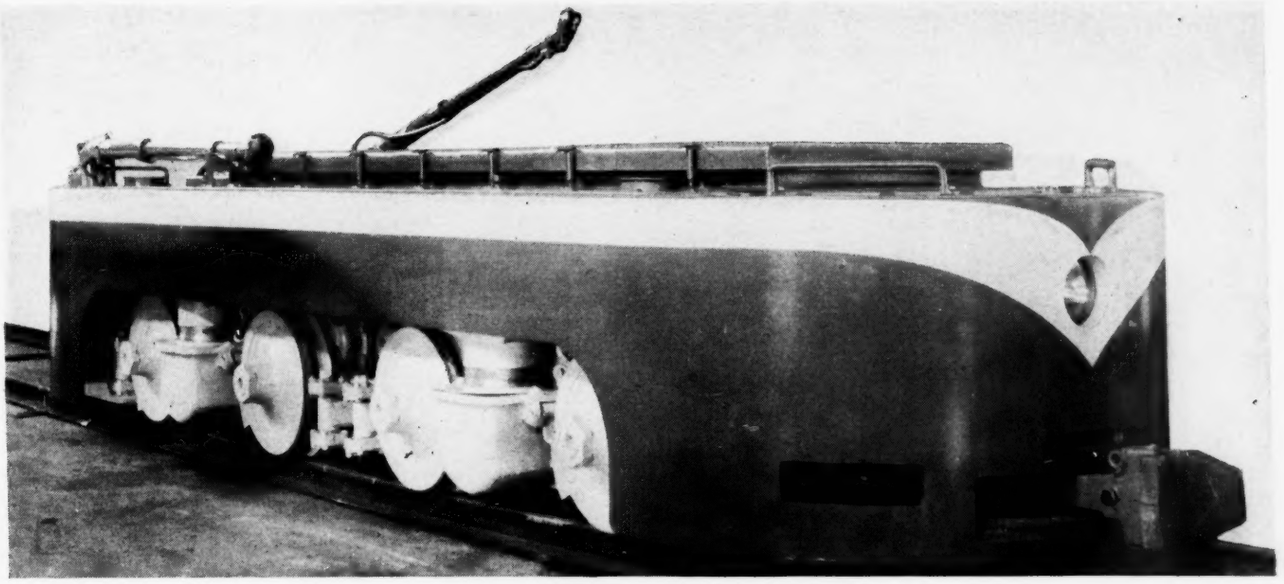
All principal buildings, with one or two exceptions, are fire-resisting.

As in most projects of this kind, the first job undertaken was an educational one. A pamphlet was prepared in which the various coordinators and their assistants were instructed in the general program and procedures to be followed.

Charles Stanley, Defense Coordinator

First of all, the program called for a review of the entire physical plant to discover vital and vulnerable points at which sabotage, especially, might be perpetrated. Some of these points were obvious: the fans, substations, shafts, powder magazines, etc. The local protection routine was built around these focal points.

Particular attention is directed toward the proper storage and distribution of explosive supplies, which were covered by peace-time regulations of the Department of Mines, in accordance with Pennsylvania laws. Under the new set-up, federal regulations came into play with particular reference to the quantities of supplies dealt out to each individual and the identity of each recipient. In fact, these new regulations account for each stick of powder like so much money. This accounting and control is rather difficult in the Southern Anthracite Field, where so much pillar and gob mining



SAFETY FACTOR

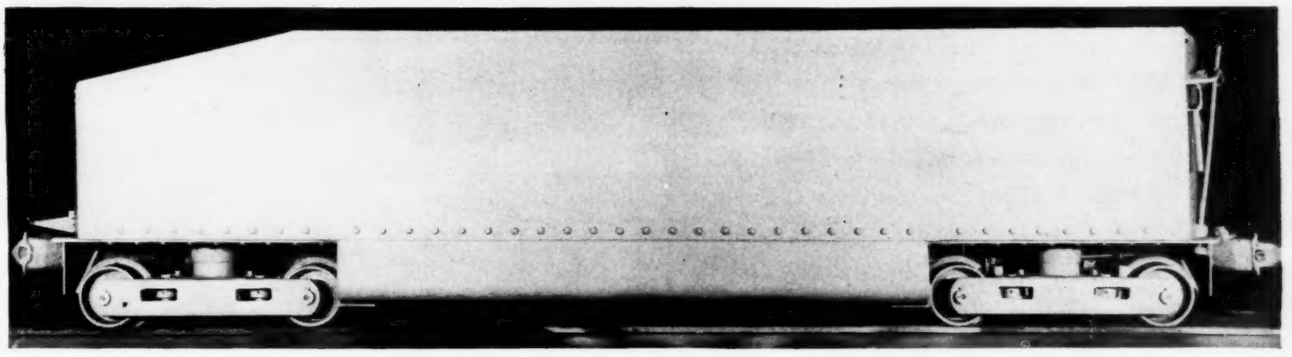
DIFFERENTIAL

8-WHEEL LOCOMOTIVES AND MINE CARS

Differential Locomotives and Cars cling to the rails, assuring high speed with safety.

Large Differential Cars with Eight wheel trucks produce more coal. Balanced design and construction details give them the "roadability" for keeping 'em on the track. These features reduce mine haulage accidents, lower compensation rates, resulting in less over-all operating costs.

You, too, can obtain the benefits of increased tonnages with safety that many operators now enjoy by making DIFFERENTIAL your choice for mine cars and locomotives. A letter to us will bring details—write!



DIFFERENTIAL STEEL CAR CO . . . FINDLAY, OHIO

Builders of Haulage Equipment Since 1915

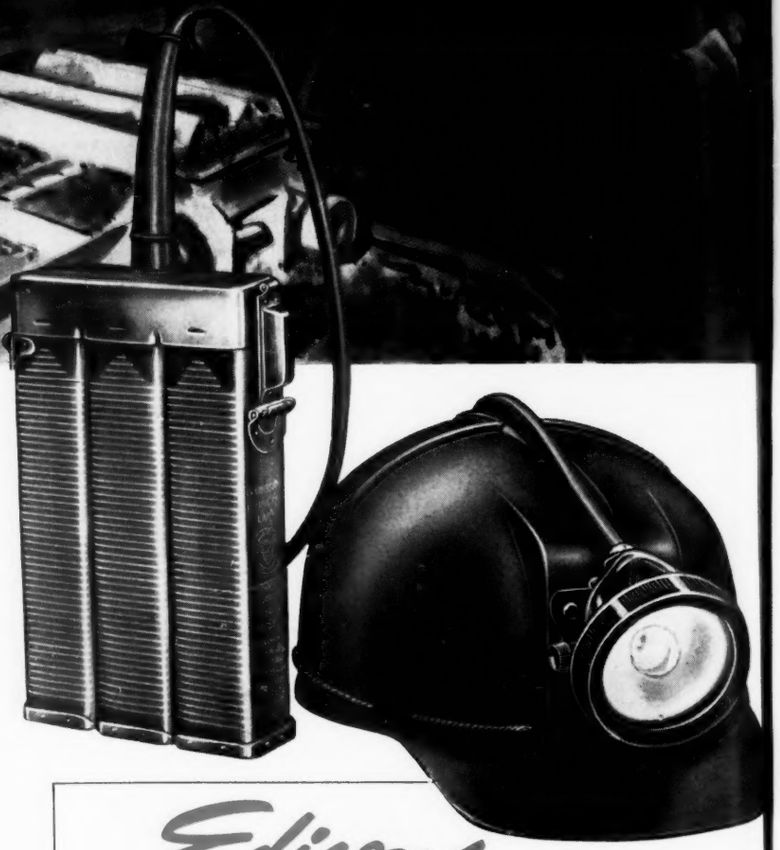
MINE CARS • STRIPPING CARS • MINE LOCOMOTIVES • ROCK LARRIES • COMPLETE HAULAGE SYSTEMS

COAL FOR VICTORY

Victory of arms cannot be achieved without victory in production of our fundamental war materials—COAL high among them.

The first essential in production at the miner's working point is *light—dependable light* which speeds coal tonnage and increases safety.

Edison Electric Cap Lamps with the famous Alkaline battery are bringing to the greatest task of our lives, truly dependable, more *effective* light —so thoroughly appreciated by management and men in the past—so invaluable today in aiding peak production of Coal for Victory!



Edison

ELECTRIC CAP LAMPS

MINE SAFETY APPLIANCES COMPANY

BRADDOCK, THOMAS AND MEADE STREETS, PITTSBURGH, PA. . . . DISTRICT REPRESENTATIVES IN PRINCIPAL CITIES

MINE SAFETY APPLIANCES COMPANY OF CANADA, LTD: TORONTO; . . . New Glasgow, N.S; Montreal; Calgary, Alta.

MINE SAFETY APPLIANCES COMPANY (S.A.) (PTY.) LTD: . . . . . P. O. Box 1680, Johannesburg, South Africa

ALSO AGENTS AND REPRESENTATIVES IN PRINCIPAL CITIES OF OTHER COUNTRIES

M.S.A. Products Include: Breathing Apparatus . . . Inhalators . . . Approved Dust Respirators . . . Masks of all types . . . Gas Indicators . . . Gas Detectors . . . Safety Goggles . . . Protective Hats and Caps . . . Edison Electric Cap Lamps . . . Safety Belts . . . Safety Clothing . . . Dust Instruments . . . First Aid Equipment . . . Protective Hand Creams. Descriptive Bulletins sent on request.

is engaged in and the quantity of powder needed cannot always be gaged accurately.

One item of considerable importance was the blocking off of unused or little-used roads, especially in the more remote areas.

Special attention also has been given to the workings of the fire-alarm system and to careful fixing of responsibility for reporting fires at their inception. Every colliery has its plant fire chief, who is required to familiarize himself with all the activities carried on in the various buildings, the location of the shut-off valves and electric switches and the storage spaces for highly combustible materials and explosives.

PERSONNEL IMPORTANT

In plant protection, the personnel problem is at least equally as important as anything of a purely physical nature. While the labor turnover of this company is unusually small, new employees are going on the payroll in considerable numbers. In the central employment office any individuals about to be employed, concerning whom there is any doubt of their loyalty, are reported for investigation by the Defense Coordinator. All employees of every class and rank are required to wear a badge of identification at all times while on the company properties. All employees reporting for work without the tag are sent home, and a number of them have been.

Movements of employees are more restricted than in peace times. To leave his usual place of employment, any employee must obtain from his foreman and present to a guard a written permit, to be shown on request to any official, guard or police officer of the company. This control of employee (and visitors') movements is simplified by a regulation designating one main entrance at each operation. Visitors wishing to go on the property are required to register at the main office and receive a special badge or permit. The permit must be returned and is then carefully filed.

The system works, as some outsiders who have undertaken to break through it unceremoniously can testify. One of the most gratifying aspects of its adoption has been the cooperation of the main body of employees. They seem to have grasped firmly the purpose and desirability of the plan, which was explained to each of them in some detail in a small leaflet reproduced in its entirety with this article.

Telling the story of war-time protective measures to Lehigh Navigation employees.

WAR-TIME PROTECTION

RULES AND INSTRUCTIONS FOR THE PROTECTION OF EMPLOYES AND PROPERTY DURING WORLD WAR II.

LEHIGH NAVIGATION COAL CO., INC.

DEFENSE MEASURES

RULES AND INSTRUCTIONS FOR EMPLOYES.

In this war which has been forced on our country, the dangers, as you know, are not confined to the battlefield, or to foreign soil. Industries are the object of attack.

The operations of the Lehigh Navigation Coal Company and the Edison Anthracite Coal Company are possible targets for enemy airplanes. There is a possibility that enemy agents will undertake to damage vital machinery. They may seek also to stir up disloyalty among our own men.

In making preparations to protect its property, the Company has even more definitely in mind the lives and safety of its employes.

Some rather far-reaching measures have been set up for your protection including a special organization of guards at each operation.

But, as you know, it would be impossible fully to cover all danger points in the mines without an army of special guards.

The Company, therefore, expects each employe in the name of national defense, company loyalty, and self interest to consider himself a part of the protection organization.

Be alert for possible dangers. Cooperate with Company officials in the effort they are making to insure your complete safety.

In war times it is necessary to lay down certain restrictions which in ordinary times may not be desirable. It is hoped that every employe will fully realize that these are not arbitrary but are imposed for his protection. FURTHERMORE, THEY HAVE BEEN SET UP IN RESPONSE TO AN URGENT REQUEST OF THE UNITED STATES GOVERNMENT.

The following special rules governing the conduct of employes have been adopted:

IDENTIFICATION BADGE

Every employe, including all monthly men, must wear at all times while on Company premises an identification tag. This tag will consist of the aluminum tag showing your symbol number.

ENTRANCES TO THE PROPERTIES

All employes must enter the properties only through the designated Main Entrances. These entrances will be indicated by signs.

TELEPHONES

Employes may use telephones for receiving or sending messages only in cases of urgent necessity and by permission of the Foreman or his representative.

ABSENCE FROM WORK

All absences from work must be by permission of the colliery officials and will be carefully checked up by the Foreman.

MOVEMENTS AROUND PROPERTIES

Any employe whose duties require him to leave his regular place of employment may do so only by written permission of the Foreman. This permit must be returned when it has served its purpose.

AUTOMOBILES

Automobiles may be parked only in the special areas set apart for that purpose.

EXPLOSIVES

Special rules have been adopted with regard to the possession of explosives, and make special provision for a careful daily and monthly check on the amounts issued to each class of miners.

All employes are particularly requested to be on the look-out for the stealing of explosives and supplies, which may pass into enemy hands and be used for destructive purposes.

CHARLES STANLEY,
Defense Co-ordinator.

Approved:
EVAN EVANS,
Vice President and General Manager.

WAR-TIME SAFETY

Highlights Supervisory Role in Mining*

Right Mental Attitude Must Be Preserved — Safety Results Will Reflect Supervisors' Acceptance of Their Responsibilities—Drive for Tonnage Must Not Be Permitted to Obscure Safety Objectives

Right Attitude Important

By WILLIAM MURPHY
Superintendent, Euclid Mine, Pittsburgh Coal Co.
Smithton, Pa.

THE NATURAL conditions and fundamental principles surrounding coal production have not changed. They are the same as they were a year ago. A rising trend in accidents, therefore, is a direct challenge as to the whys and wherefores.

Some of us probably are of the opinion that it is due to our workers being pushed for more coal, but our records show that they are not loading as much as they were a year ago. Others are of the opinion that it is the effect of the war. I believe that this, plus the war boom in industry, is true.

Our newspapers and radio tell so much of its terrible destruction that we are beginning to hold life too cheaply. Our workers' minds are not functioning along the same channels as in peace times, and there are several types of mental attitudes that are detrimental to safety. They include the four which follow:

1. First we have is the family man, who in peace times is one of our safest and most productive workers, interested only in making a living for that family and in keeping himself safe and physically fit so that he will be able to continue to provide for his home. Let us picture him as he is today. He is still as good a worker as ever, but he has a son, or perhaps two sons, in the armed forces of our country, and his mind is very much changed. True, he is working and producing as much coal as ever, but he is thinking of war, and his boys, and the sacrifice that they may have to make. It is during these periods of thought that he may unintentionally allow himself to neglect some phase of his work that may result in a serious accident.

The safety of this man is, to a great extent, in the hands of his foreman, who should know that this man has a son, or sons, in the army, and who should be a missionary of safety, talking safety to this man and convincing him of the necessity of keeping himself safe now more than ever.

2. Second is the man who in peace times was a good, safe worker, but today is classified to be called to the service at any time. In short, he is marking time, with no real objective in view and is liable to injury because he is just going through the motions of his job without any incentive whatsoever. Here is another situation where the foreman must be on the alert and do a continual safety-talking job if accidents from this type of employee are to be avoided.

3. Then we still have the men who even in peace times are more or less indifferent to their work and who, in normal times, are quite a problem to the management, but today are more so. This is due to the fact that work is plentiful and men are scarce, which creates a tendency on the part of the management to try to get along with this kind of man rather than lose him. It would be much better to lose him to some other industry than bury him. When we do that everybody loses.

4. Fourth, and last, man's condition is really a problem. At the present time our employees are earning good wages and have plenty of spare time on their hands. Their social activities on week-ends, and occasionally through the week, are not good for their physical fitness. The results are idle men and the potential accident hazard of temporarily placing other men in their jobs; or, if they do show up for work, they are not capable of keeping themselves efficiently safe and productive. We are better off without this type of men, and the sooner each mine disposes of them, after all other efforts have failed, the better it will be for the organization and for the men themselves.

MUST INSIST ON SAFETY

So much for our employees. Our next problem is management, and in my opinion it is of the greatest importance. Our supervisory force is practically the same as it was a year ago, but conditions have changed. Due to the war, we are short of men and are nursing the men we do have, trying to hold them, even to the point of sacrificing safety. I believe this is one of our gravest mistakes, because even if we do drop a man here and there because of unsafe practices, we have gained in the long run, simply because the rest of our employees are impressed with the fact that we will not tolerate carelessness.

We now come to the place where we may hurt someone's feelings. Before the war, when times were normal and supervisors' jobs were not too plentiful, a foreman accepted his job with the realization that it was up to him to keep his job secure through the quality of his workmanship; but today, with the mines operating at capacity and other mines opening up, there is a scarcity of foremen. We realize this and are coasting along, with a rather serene feeling that if we lose this job we can easily pick up another. Men

* Articles in this symposium were abstracted from reports of addresses by representatives of the mine supervisory group at the Oct. 17 safety conference of the Pittsburgh Coal Co., held at Washington, Pa., and participated in by the executives, mine supervisors and inspection staff.

SAVETY

"That's no way to spell safety"

BACK: Maybe it wasn't, Forth, before Pearl Harbor; but today "savety" means conservation, proper maintenance of coal mine equipment and a lot of other things.

FORTH: But you're trying to combine Victory and Safety.

BACK: Exactly! Today they're one and the same. Mine accidents constitute a fifth column and we can get victory out of safety only by eliminating that fifth column.

FORTH: I get it. Care in using equipment that may have to last the duration, is one sure way of cutting accidents and upping production.

BROWN-FAYRO EQUIPMENT MEANS SAVETY

Typical of many items in the Brown-Fayro line—the automatic Car Spotter saves time and increases production. Because it takes the guesswork out of loading coal cars—it helps cut down accidents. The model H-M Car Spotter keeps a constant supply of empty cars at the loading point—so that the conveyor pours coal continually without shut downs to change ropes.

OTHER BROWN-FAYRO "SAVETY" PRODUCTS

- Hoists
- Blowers
- Pumps
- Retarders
- Mine Cars and Wheels
- Rerailers
- Sheaves

Get the data on other Brown-Fayro equipment—bring your problems to our Engineers. Write today.

THE BROWN-FAYRO COMPANY
940 ASH STREET JOHNSTOWN, PA.

who are doing this, probably sacrificing the safety of the men who are working for them, will have a lot to answer for some day, because the preservation of human life and limb is not alone a company requirement but as individuals it is our duty to put a stop to this sacrifice of human life and limb. It is entirely in our hands to obtain this, as the quality of our safety record will be no better than the effort we put into it. *It is up to us.*

Safety-Mindedness Vital

By ROY R. NEWHOUSE
Assistant Foreman, Warden Mines, Pittsburgh Coal Co.
Sutersville, Pa.

STOPPING accidents now is more vital than ever. Many men in coal mining have boys on the battlefield who need guns, planes, tanks, shells, and clothes, and we of the home front must see that they are provided. To do this we must work together to provide safe working places, safe devices and tools and, above all, safe supervision.

When the State certified us we accepted an obligation to provide for the health and safety of the men employed in and about the bituminous mines of Pennsylvania and for the protection and preservation of the property connected therewith. Some of us have failed to live up to our obligations in regard to safety. Why? Because we are not safety-conscious ourselves. We as foremen must be safety-minded at all times to teach safety. We must act and work safely. We must set the example; we must be a model in the eyes of our men in the things we do and the things we say. Our conduct at work, at home and in the community must be that of a leader. We must have our men believe in us and when they do they will fall in line with our safety policy.

WHEN FOREMAN SLIPS

I am going to tell you about an assistant mine foreman who had been a good official but started to slip because he forgot all about safety for tonnage. I am going to call him Dan. I was sent into his section to see why his tonnage had started to drop, and his accidents had started to go up.

As I entered his section I heard someone working in the back entry. I went in and found a dayman cleaning out a drain. There was loose coal and slate on the sides, which was very dangerous. I asked him who had sent him to work there. He replied, his boss. I asked him if his boss had been there to examine the place. He said no. Dan failed here because he should have gone with the man to show him where to work and what he wanted done. He should have had the place made safe.

I went on up the entry and found a man cleaning out an old breakthrough. He was breaking a large piece of slate. He was not using his goggles. I asked him why he was not wearing his goggles to protect his eyes. He said that Dan had never told him to wear goggles—just hurry up and clean the breakthrough. I asked him what he was cleaning the breakthrough for. He said he didn't know. Dan had failed again. He did not make sure that the man was wearing goggles when breaking slate. Goggles should be worn when doing any work where flying particles may hit the eye. Dan also had failed to get cooperation from the man by not telling him why he was having the breakthrough cleaned. Had the man known why it was being cleaned he probably would be doing a better job.

I went from there into No. 5 room. Two timbermen were setting two timbers. I sounded the roof at that point. The roof was solid and I couldn't see why Dan would want timber set there. I made a further examination and found that the roof was very bad some distance back from the face where a cutter in the roof crossed the roadway. I asked them where Dan had told them to set the timber. They said that he told them to set two crossbars in No. 5 room but he didn't say where. Dan had failed again. He had failed to give proper instructions and then check to see that they were doing a good job. They were doing a very poor job of timbering. I asked if Dan had ever told them to do a better job. They said that the only instruction that Dan gave them was hurry and stick up a couple of timbers.

I went from there into No. 4 room. The tracklayers were laying a switch, using an ax to drive the spikes. There was no hammer. Dan, it came out, had promised to get one three or four days ago. Driving spikes with any tool other than a well-faced spiking hammer is dangerous. Dan had failed again. He promised to do something and then forgot about it.

Then I met the cutters in the next place. They had just finished cutting and there were no sprags set against the face. Tools were on top of the machine. The place was not properly posted. The safety lamp was not burning and the bugdust had been only partly shoveled. I asked why they performed their work in this manner. They said Dan had told them to hurry up and get the place cut. They didn't have time to wait for the timberman to set the posts. Dan had never told them about proper bugdusting or the danger of not caring for their safety lamp. Dan had fallen down again.

TONNAGE VS. SAFETY

I went into the next place and found the motor off the track. After it was rerailed I watched them make a few trips into the place. It was soon evident why they were getting off the track. The joints were not staggered, the ties were not properly spaced and the track was out of line. They were ripping and tearing into and out of the place as if they were running a race. Dan had failed again. He did not see that the track was maintained and he did not see that the motor crew used common sense when running over temporary room tracks. He was trying to get tonnage with safety by pushing the workmen beyond their means.

In the next place I heard the shotfirer call "Fire" and off went the shot at the same time. I asked him why he didn't call "Fire" three times before he fired the shot so that other workmen would have time to get in a place of safety. He said he could not do that. I asked him why. He said: "I got a short cable and the electric go too fast." Dan had failed again. He had not put the right man on the job and he had not provided him with at least 125 ft. of cable.

All this time on the section I had not seen Dan. Yet every time I asked the man about him they would say he had just left.

I went into the next place. The

(*Turn to p. 84*)

SAFETY FEATURES OF DRILLING TOOLS

ARE IMPORTANT, too!

Probably the most hazardous drilling operation from a tool standpoint is drilling with a hand held electric drill. The hazard consists of the driller getting "kicked" by the drill from a shock load applied suddenly to the tool point. This can be severe enough to knock the driller down violently with resultant injuries to his head, hands, ribs, etc. This hazard has been recognized by the drill manufacturers who now offer models with built-in safety clutches. However, there are several thousand drills still in service without safety clutches.

As a means of minimizing this hazard, we have developed the safety type of auger drill coupling illustrated. With this device, the auger "buttons" to the drill socket in a way that is positive, offers no projecting or irregular-shaped parts to catch the driller's glove, and can be readily uncoupled.

This Hexanspeed coupling puts "controlled" action into the hands of the driller, for with it he can exert or withdraw pressure from the drill bit at will and thus regulate the rate of feed to the drilling requirements *of the moment.* Controlled action means that the driller need no longer follow his tools; instead the tools follow his will.

Operating a hand drill under these conditions *is safer,* for the driller is more the master of his work and as such can safeguard against falling into a dangerous drilling situation.

In operating post mounted drills, one of the most dangerous practices is to grab the thread bar or socket while it is turning. This is done to hurry the changing of augers along and thereby keep up more easily with the day's drilling, or merely to steady the action of the drill for the moment. Many gloves have been caught and many hand injuries can be traced to this practice.

Our revolving sleeve safety sockets of the type illustrated are a good cure for this type of injury. The drill socket turns inside the sleeve while the thread bar is in motion. While the idea is not new, here is a good, practical design that revolves freely on its ball bearing and is shaped to the grip of the hand so nicely that the *urge* is to grab *it* and not the thread bar.

In drilling horizontal and vertical holes at stripping operations, the drilling tool hazard is less obvious. It is confined largely to finger injuries that arise from missing the mark when the driller is engaged in uncoupling his auger connections by chiseling off the cotter pins or nails that hold the augers together. This hazard has been eliminated by the Hexanspeed auger coupling of the type illustrated. No nails, cotters or hammers are needed to work this coupling. The augers are merely pressed together to automatically couple. To uncouple, a plier type hand tool of the type illustrated depresses the coupling pin. In addition to being safe, this coupling speeds up the drilling 10% to 30% depending upon the number of auger changes ordinarily made in a day.

COALMASTER

BLAST HOLE DRILLING TOOLS

★ A Coalmaster Matched Set is a set of tools complete from drill to drill point. Each item in the set is designed to go with the other tools in the set and collectively do a certain type of drilling job *exceedingly well.*

Our representatives are drilling specialists,—men trained by experience to select the tools that will meet your particular requirements best. They are all anxious to work with you to solve your drilling problems.

CENTRAL MINE EQUIPMENT CO.

ST. LOUIS, MO.

"The Drill Bit People"

Koehler Mfg. Co.

BRANCH & INTER-OFFICE CORRESPONDENCE

DATE 8/3/42
FROM KCP:M
OFFICE Marlboro

TO All Mine Lamp Sales Departments

REF. (Wire) (Letter) Mine Lighting and the War Effort

SUBJECT Care of Wheat Cap Lamps, Batteries and Parts

Nearly all materials used in the manufacture and maintenance of Wheat Cap Lamps and Batteries are classified as critical and needed for our war needs.

Don't allow abuse or neglect of their care in the lamphouse, or while they are in use.

Don't permit worn or damaged lamp parts to be scrapped -- arrange that they be properly stored and returned to us for reclamation.

Don't fail to check all lamps at regular intervals -- be sure they get the proper charge and watering.

Make sure that all surplus lamps are routined once each week -- thus avoiding deterioration.

Don't let the war effort down -- keep coal tonnage rolling up!

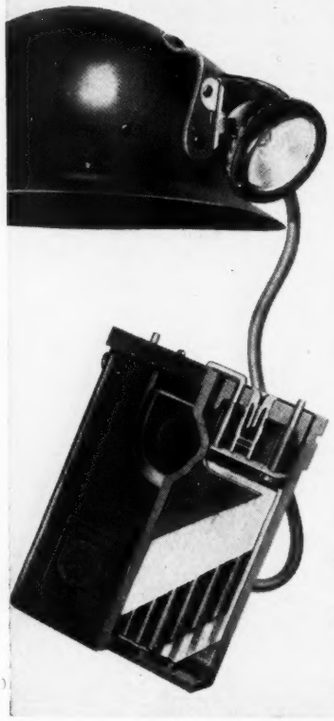
The factory will do their part to maintain good mine lighting, and ask that you do likewise, so that our combined efforts will help to insure victory.

K. E. Pouring.

WHEAT

The Engineered Cap Lamp

Here are the features . . . judge for yourself!



1 Two bulbs (one for emergencies) — miner is never in the dark.

2 Center mounted, Krypton-filled bulb, gives 20% more light — no dark "shadow spot" in beam.

3 Choice of 3 reflectors gives narrow concentrated beam, a medium beam, or a widespread beam of light — suits all working conditions.

4 Headpiece weighs less than 6 ounces, Lamp Cord 6 ounces, Battery 62 ounces — Total weight of Lamp complete 74 ounces.

5 Headpiece molded of strong bakelite; sealed, moisture-proof and dust-proof.

6 Rubber battery case — non-conductor of electricity — a valuable safety feature.

7 Battery solution (free) limited to one ounce total both cells.

8 Lead-acid type battery maintains high voltage throughout shift (80+% efficiency) — year after year.

9 Battery charged through headpiece and cord of cap lamp — a daily test of all connections.

10 Designed for self-service charging system for lowest lamphouse operating cost.

11 To charge, headpiece is simply slipped on to key in charging rack, and turned to make contact. Nothing to take apart — unit-sealed construction.

12 A payment plan (purchase or rental) to meet the requirements of companies — large and small.

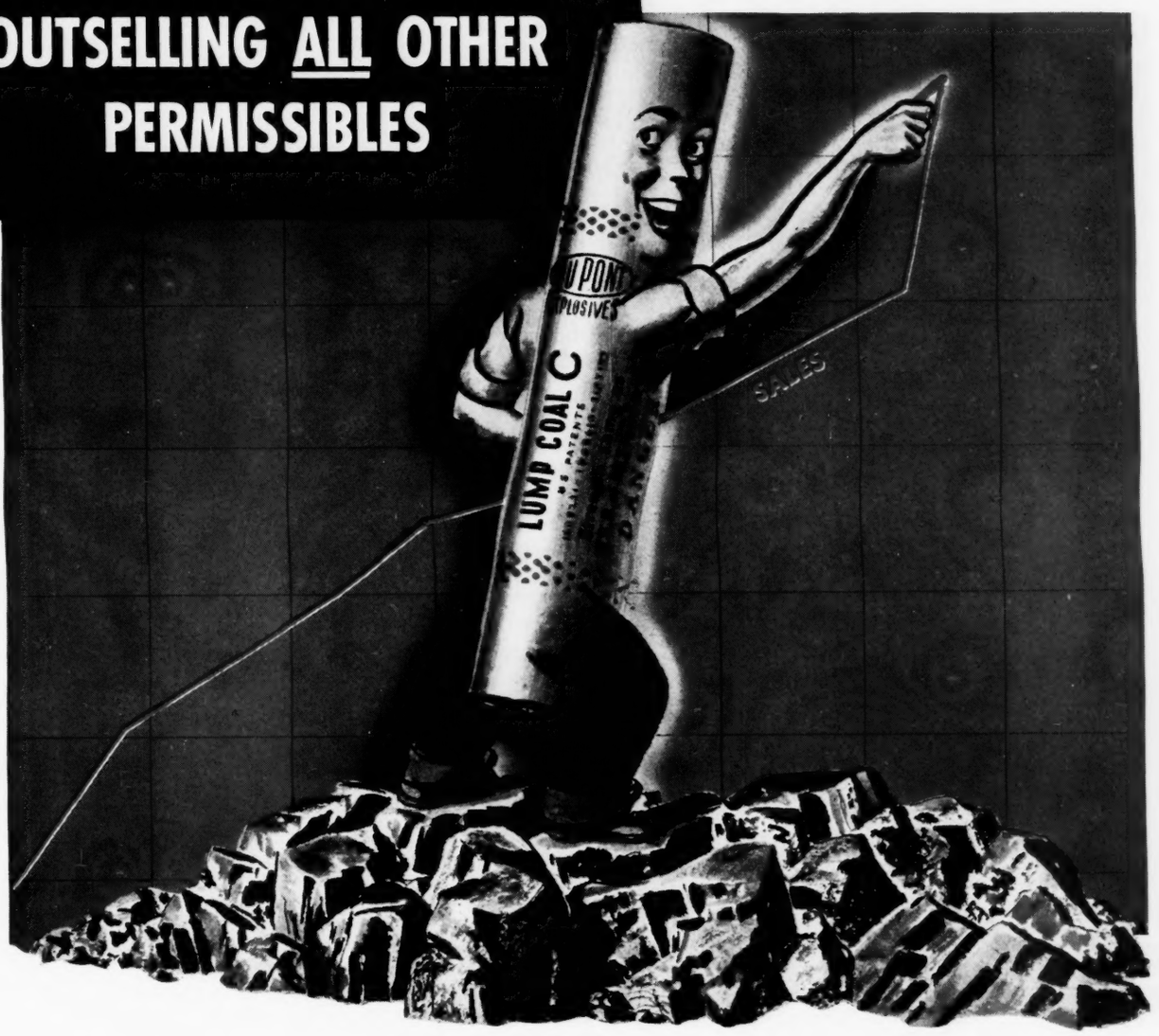
Note—More New Wheat Cap Lamps were installed in the U.S.A. during 1940-1941 than in any previous 2-year period

"Wheat Mine Lamps are the only Mine Lamps 'powered' by Exide Ironclad Battery Plates made by The Electric Storage Battery Co., The World's Largest Manufacturers of Storage Batteries for every purpose."

Write today—
WHEAT LAMP SALES, INC.
1501 Kanawha Valley Bldg., Charleston, W. Va.

SPECIALISTS IN MINE LIGHTING FOR 25 YEARS
KOEHLER MFG. CO.
Marlboro . . . Mass.

OUTSELLING ALL OTHER PERMISSIBLES



More Du Pont "Lump Coal" C was used in U. S. coal mines last year than any other permissible.

The reason—because "Lump Coal" C makes it possible for many mines to load *more tons per day*, at lower cost per ton.

Its ultra-slow heaving action rolls the coal forward, away from the face. permitting faster loading, with minimum wear and tear on the loader.

In short, "Lump Coal" C gives the nearest thing to black powder action available in a permissible.

Other production advantages include a remarkable spreading action, frequently permitting fewer drill holes per face—and excellent fume properties, another important factor in mechanical loading mines.

If you're switching over to permissibles, or if you're not satisfied with present performance, see your du Pont representative about "Lump Coal" C, the permissible that *outsells all other permissibles*. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington, Delaware.

* * * *

Du Pont Permissibles are available to meet every requirement. Over 20 different types and grades give you a selection that assures efficiency on every job.

HELP SAVE FATS FOR EXPLOSIVES
Kitchen fats are urgently needed for making glycerin—an essential ingredient in the production of high explosives. Urge housewives in your area to aid the war effort by taking waste fats to their butcher.

DU PONT
REG. U.S. PAT. OFF.

"LUMP COAL" C

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

driller appeared to be preoccupied. He was not putting much into his work. I talked to him and found that he was worrying about sickness at home. I could see he needed someone to talk to. I sat down with him and let him tell me all about his troubles. I gave him advice and encouragement. He appeared to be more cheerful and thanked me for my interest in his personal problems. I asked him if he had talked to Dan about his home troubles. He said that he had tried to but that Dan didn't have time and said he would be back later. Dan had failed again. Dan was striving for production but he didn't have time to stop to find out why he wasn' getting it. This man was in a fair way to contributing to his bad accident record.

After leaving this man I started back down the entry. I met Dan and he looked as if he was about washed up. One pant leg was in his boot top and the other, ragged and torn, was outside. For shoestrings he had a piece of twine in one boot and a piece of shotfiring wire in the other. His shirt was open because there were no buttons; his shirttail was hanging out, his jacket was torn and his hair was disheveled. Dan was about the poorest dressed man on the section.

I think that Dan was defeating his purpose by his own attitude toward himself. I believe that a foreman should dress according to his position, have a certain amount of dignity and be able to say "Yes" and "No" and mean it if he is to gain and hold the respect of his men.

In closing I would like to leave two thoughts: First, do not forget the obligation you took when you were certified by the State Department of Mines. You obligated yourself to look after the health and safety of the employees under your charge when you accepted your State certificate. Second, there is always an accident waiting to happen —so don't let it get on your section.

EXPLOSIVES AND HAULAGE

Themes of Mining Section, Safety Council

Explosives Accidents in Anthracite Mines Reduced 50 Percent by Conformance to Shooting Code—Hygiene Plan for Coal Mines Advocated —How to Reduce Mine Haulage Injuries and Curb Explosives Sabotage

"WE KNOW that when the war is over many more millions of people will be aware that safety is one of the techniques of living. Together with air transportation, surgery and plastics, the war will hurl safety ahead to goals it otherwise might not have achieved in a generation. Productive man-hours saved denote casualties reduced among the men in uniform as well as among the men in overalls," declared Col. John Stilwell, president, National Safety Council, opening the 31st National Safety Congress, Chicago, Oct. 27-29, at which the Mining Section discussed use of explosives, safety in transportation and shuttle-car service and operation of the Federal Explosives Act.

Too Effective a Shot May Expose Its Neighbor—Delay electric blasts, declared R. D. Currie, engineer, General Reinsurance Corp., Trucksville, Pa., at the opening session, are dangerous: (1) because they always are used with dependent shots, the action of which in firing cannot be correctly anticipated. If a shot misses, goes off out of turn or fails to accomplish the demolition desired, it leaves a dependent shot under an overload which may cause it to blow out and possibly ignite coal dust or methane. Again, a shot may be so effective as to give a dependent shot little or nothing to do, with the result that flame may fire methane or coal dust. (2) Because a later shot may ignite the methane released by an earlier one. (3) Because, even with all-metal delays, one or more of the shots may fail and the miner will not know because he may have been unable to make a correct count.

Firing Lines in Anthracite Mines—In steeply pitching anthracite mines, permanent No. 18 cotton-covered annunciator wires are in general use and are kept shunted. In a few, small switches "short" the firing lines when not in use. These are single-pole switches which, when closed, join the two lines and form a short-circuit. Most of these fixed lines are suspended on specially designed wood cleats nailed to timbers or ribs.

In flat beds, as are usual in the Northern Anthracite Field, portable lines, generally twisted or parallel pairs of No. 14 copper wire with braided insulation, are frequently used. Many are distinctively colored, usually yellow, to distinguish them from power-carrying lines such as are used for signaling or operating electric coal drills.

Bituminous Practice—Bituminous coal almost universally has adopted the special rubber-covered shotfiring cable, though some, as in Utah, employ permanent firing lines that connect all shots in the mine so all shots can be, and are, fired from the surface when no one is underground.

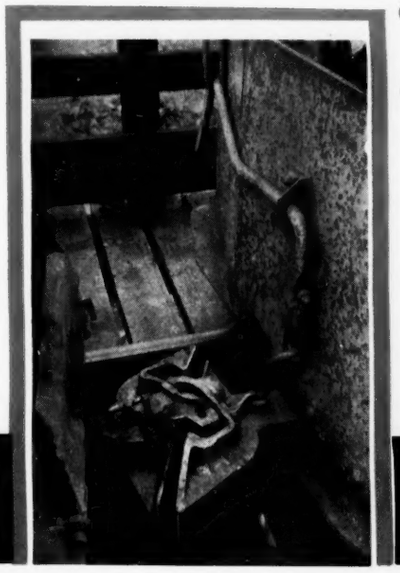
Blasting Units—Shotfiring power usually is derived from small portable blasting units or blasting batteries, generally of magneto or generator type, although many districts use special storage-battery units or small dry cells with recessed terminals to prevent accidental contact. Push-down types of blasting machines, designed for firing 50 or more shots in series, sometimes are found in coal mines, and some miners still fire their shots from the trolley line or other high-voltage circuit. Although 110- to 440-volt current, direct or 60-cycle alternating, may be suitable for blasting at surface operations, it definitely is unsafe to use it in coal mines.

The greatest safety hazard in non-

WILLISON
AUTOMATIC COUPLERS

. . . provide the SAFETY that results in

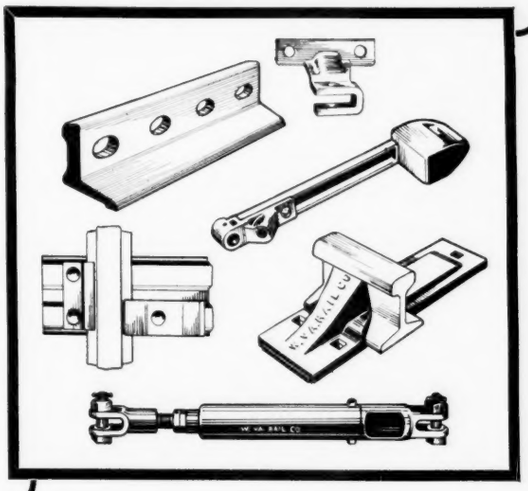
- SPEEDIER TRIPS
- REDUCED OPERATING COSTS
- GREATER PRODUCTION



In modern mechanized mining methods, the accent is on safety . . not only safety for men, but safety for equipment as well. Under these conditions, the use of WILLISON Automatic Couplers becomes increasingly important to profit-wise operators. WILLISONS eliminate the cause of costly car coupling accidents to men. Everything is automatic. WILLISONS conserve equipment, cut operating costs, speed up trips, thus allowing more trips per hour which means greater production.

Write for Circular #5240

NATIONAL MALLEABLE AND STEEL CASTINGS CO.
General Offices: CLEVELAND. OHIO
Sales Offices: New York, Philadelphia, Chicago, St. Louis, San Francisco.
Works: Cleveland, Chicago, Indianapolis, Sharon, Pa., Melrose Park, Ill.



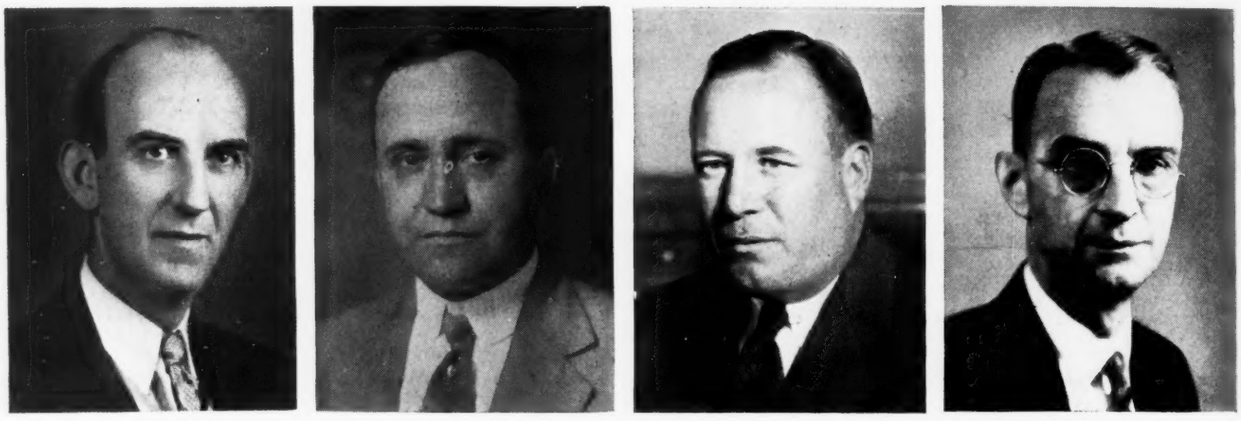
Little things count in
LOWERING THE HAULAGE ACCIDENT RATE!

• We urge you to take time *now* to thoroughly inspect your haulage ways . . . particularly those little items, such as shown above, which are subject to great wear and strain. By replacing these items, you can materially lower your haulage accident rate . . . in some cases, eliminate it altogether.

We can assure you prompt, on-time delivery of any of our small products . . . so don't wait . . . act now, and get the safety so necessary under today's expanded production requirements. Look your trackwork over . . . write us, listing the weak or broken items you wish to replace. Or, call in a West Virginia Rail engineer . . . he'll go over your track equipment and point out the unsafe products . . . the spots liable to cause lost time accidents . . . and recommend suitable items as replacement parts.

THE WEST VIRGINIA RAIL COMPANY
HUNTINGTON, WEST VIRGINIA

Some of the new Mining Section officers (left to right): John Treweek, general chairman; John T. Ryan Jr., chairman, entertainment committee; Dan Harrington, secretary; and Cadwallader Evans, chairman, membership committee.



Mining Section speakers (left to right): R. D. Currie, W. W. Adams, Harry M. Moses and Clyde G. Brehm.

permissible blasting units is that the discharge current can ignite explosive gas. The U. S. Bureau of Mines declares that many field tests have shown that any 5- or 10-shot generator-type unit in operating condition may produce sparks that will ignite explosive mixtures of methane. The permissible 10-shot generator type blasting unit has an automatic time switch which limits the duration of the firing current to 4 to 6 milliseconds (0.004 to 0.006 second). This switch will interrupt the current after the bridge wires have become sufficiently hot to ignite the detonator in the cap but before there has been any movement at the face that would break the firing line and cause a spark to form. In those Utah coal mines in which all shots are fired from the surface with all men outside, special switches or controllers that limit the duration of current are used.

What Makes a Permissible Explosive Permissible—A permissible explosive (1) should be in all respects similar to sample submitted by manufacturer; (2) should be shot by electric (not fuse-actuated) detonators of an efficiency not less than that of a No. 6; (3) should be fired by a permissible blasting unit; (4) should, if once frozen, have been thawed thoroughly in safe and suitable manner; (5) should not be charged in weights of over 1½ lb. per hole; (6) should be properly confined with clay or other incombustible stemming; (7) should not have a diameter less than stated in the Bureau's tabulation; (8) should not be fired in the presence of a dangerous percentage of firedamp; (9) should not be dependent in its action on any other shot, placed in a hole bored in the solid or burdened so that it obviously is likely to blow out and (10) should have been stored so as not to have undergone a change in character.

Tons produced per fatality from blasting accidents are shown in the accompanying table in order of rank except that in the cases of the two states without fatalities they numbered first and second in order of tons produced per injury. Fig. 2 shows the production per explosive fatality from 1936 to the first six months of 1942.

Some bad practices disclosed by anthracite blasting accidents as recorded by S. P. Howell, explosives engineer, U. S. Bureau of Mines, in Bulletin 326, were presented by Mr. Currie along with the Code of Recommended Practices for the Use of Explosives in Anthracite Mines of the Mine Inspectors' Institute of America. Between 1939 and 1941, the latter, he stated, reduced explosives accidents in the anthracite mines 50 percent. One insurance company, he said, had recommended this code as its standard. None of the operations have accepted the entire code, but many have improved their practices, and its rules are being put in force as rapidly as possible.

Special Blasting Current—Explosives are brought into the salt mine of the Retsof Mining Co. only once a week—Saturday—and are stored in underground magazines located in worked-out chambers in the mine, stated L. L. Naus, mining engineer, U. S. Bureau of Mines, Wilkes-Barre, Pa. They are transported in specially

Leading Operators Say—

This Service Helps Save

MEN MATERIAL and MAN-HOURS!

AT THE FACE!
EXTRA PROPS ARE EXTRA PROTECTION!
ALWAYS set enough and SOON ENOUGH
To Promote SAFETY
DOUBLE-BOTAGE!
1 Careless handling of cables destroys Vital Materials!
2 Causes accidents which slow up War Production!
To Stop WASTE
IT SHALL NOT HAPPEN HERE!
Nazi Court Backs Penalty For Miner Idle on Sunday
BUT WE MUST WORK AND FIGHT TO PREVENT IT!
BE ON THE JOB EVERY WORKING DAY!
To Prevent ABSENTEEISM

THE disastrous effect of accidents, absenteeism, and waste on war production schedules is well known to progressive operators. But unless this fact is "put across" to your men it will not help you meet current demands! ● Your employees must be constantly stimulated and made enthusiastic cooperators with management in order to stop these enemies that are sabotaging your production. ● The Elliott Industrial Bulletin Board Service is now creating and maintaining this spirit of "all-out" cooperation for "all-out" production at hundreds of mines—it can do the same on your properties! ● For an illustrated folder which describes this effective method of saving men, material, and man-hours write today to—

ELLIOTT SERVICE COMPANY

219 East 44th Street
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Established 1911

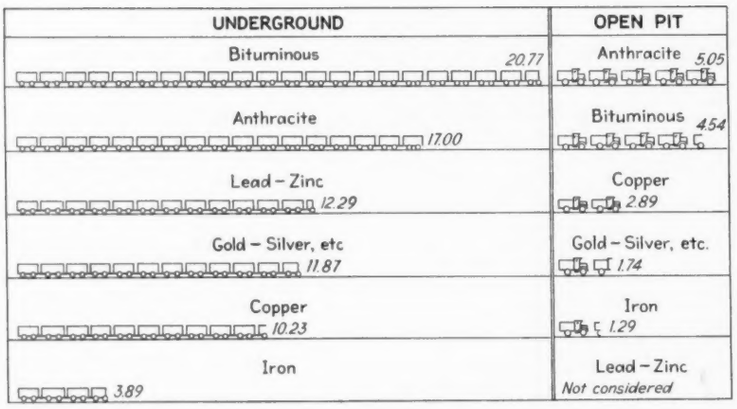

Fig. 1—Underground and open-pit haulage accidents per million man-hours of exposure, 1931-40.

constructed explosives cars from the shaft to the magazines. The inner compartment is insulated from the exterior compartment, from which it is separated by a 2-in. air space. The chambers and headings are 55 ft. wide, and 54 holes are drilled in each face, each hole being loaded with 20 percent ammonium-nitrate explosive.

The primer cartridge is placed about in the center of the charge with the detonator pointing toward the bottom of the hole. All the holes are blasted from sectional blasting boards. Blasting lines are covered with red fabric, return lines with black, and telephone lines with yellow, so that one type of line cannot be confused with another. Shots are fired from a special line carrying 275 volts d.c., after all men but those throwing the switches are out of the mine.

This firing line is not used for any other purpose than blasting. The direct current used for haulage is cut off at the shaft bottom before the shots are fired. Then the blasters connect the rounds and, after they have reported by telephone to the top man, the blasting power line is connected, indicated by a red light at each blasting station. There are three rounds in each working face, and after each round is fired the blasting power is shut off, the blasters enter the place, charge the next round, make the necessary connections for another round and report this fact to the man controlling the master switch, who turns on the current, whereupon the several blasters throw the switches at the sectional blasting board that fires their round. There are two Aerovane-type fans underground, each in a Transite stopping. No accidents from explosives have occurred at this operation in 16 years.

Use Masks When Connecting Shots—At his mines, said W. D. Haselton, general chairman, mining section and safety supervisor, Pickands, Mather & Co., Duluth, Minn., who presided, the entire face is charged at one time, but the charges are fired in three steps, or rounds. In connecting the shots, all-service masks are used to protect the blasters against the explosive fumes. No secondary shooting is necessary. Instantaneous blasting caps are used.

In reply to Cadwallader Evans, Jr., vice-president and general manager, Hudson Coal Co., Scranton, Pa., who asked what was done when a shot or shots failed, Mr. Naus said that misfires are reported in writing to the underground foreman's office and are taken care of the next evening, which worked no hardship, as there were plenty of working places. Replying to Thomas R. Millen, assistant to Mr. Evans, Mr. Naus stated that trolley and cable-reel locomotives were used. The roof was remarkably strong, only 9 to 10 ft. being taken out of the center of the seam. No blasting is done during electrical storms.

Suggestions From Delaware Aqueduct Experience—Discussing the benefits a mining company may expect from the establishment of an industrial hygiene plan, Dr. Leonard Greenburg, executive director, division of industrial hygiene, New York Department of Labor, New York, said that the value was well illustrated in driving the 85-mile Delaware Aqueduct of the City of New York, which is about 20 ft. in diameter, with its deepest point 1,500 ft. below the surface. In cleaning out rock-drill holes, it is customary to pass compressed air down the hollow center of the drill, but in the Delaware tunnel water was used as well as air because, if air were used alone, dust would be driven out into the tunnel.

One blowout and considerable quantities of methane were found in the tunnel on the west side of the Hudson River. To obtain health and safety, Dr. Greenburg advocated the formation at mines of an industrial hygiene organization consisting of a chemist, a doctor and an engineer, headed by the top fireboss, because the time is coming when more stress will be placed on health and because any dust, even coal dust, causes much injury if too much of it is breathed. With better hygienic conditions, compensation will be reduced and production and morale will be increased.

In his report as secretary, Dan Har-

(*Turn to page 144*)

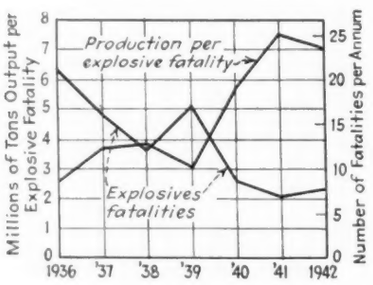

Fig. 2—Anthracite explosives deaths and production per fatality, 1936-42.

ACCIDENTS FROM EXPLOSIVES IN COAL MINES, 1940

State	Output Millions of Tons	Explosives Used in Coal Mines (Thousands of Pounds) Permissible	Dynamite	Black Powder	Pellet Powder	Fatalities	Injuries	Million Tons Per Fatality	Million Tons Per Injury
(1) Tennessee	6.00	233	96	750	975	0	6	.....	1.000
(2) Colorado	6.65	722	46	100	225	0	10	.....	0.665
(3) West Virginia	126.36	13,923	422	300	1,125	5	88	25.272	1.436
(4) Pennsylvania Bituminous	116.96	12,880	1,118	1,900	2,600	5	65	23.39	1.799
(5) Ohio	23.05	466	1,235	1,500	2,275	1	24	23.05	0.960
(6) Virginia	15.63	1,631	128	500	575	1	14	15.63	1.116
U. S. Bituminous	461.32	43,921	12,554	22,775	25,650	33	316	13.980	1.460
(7) Illinois	51.01	3,453	1,729	6,275	7,050	4	25	12.753	2.040
(8) Kentucky	48.29	2,860	520	2,900	3,300	5	47	9.658	1.027
(9) Wyoming	5.84	886	71	75	100	1	1	5.840	5.840
(10) Pennsylvania Anthracite	51.49	13,900	14,132	675	4,200	9	180	5.721	0.286
(11) Alabama	15.49	3,303	150	700	1,050	3	14	5.163	1.106
(12) Indiana	18.72	1,136	4,052	1,400	1,950	4	4	4.680	4.680

Safer Wash-up Strategy Helps Speed Production

That's why the far-sighted management specifies *LAN-O-KLEEN. Lan-O-Kleen gives proper hand-cleaning with the PLUS VALUE of "Work-Conditioning" your workers' hands.

Lan-O-Kleen cleans thoroughly, removing 95% of all soils encountered in industry and does so without harsh or chemical action. Even more important, because it contains lanolin (an oil almost identical to the natural skin oils), Lan-O-Kleen helps maintain a normal healthy skin.

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55 BRANCHES Coast-to-Coast and in Canada

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For many years in large and small mines, American Mine Doors have perfectly controlled air circulation. They step-up tonnage with speedy hauling by positive mechanical opening and closing for trips even as fast as thirty miles per hour.

★ American
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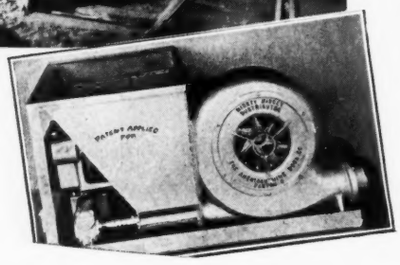
Mine electricians tell us this is the finest electric switch—positive acting longer lived. The AMD catalogue on switch throws is a useful piece of literature for your files.

★ American
MIDGET ROCK DUSTERS

"Dustributors" are made in several sizes and models. There is a "dustributor" for every job in every mine. The Mighty Midget "dustributes" more than a ton per hour. Gas pocket explosions can't spread in rock dusted mines. Write for catalogues.



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★ Save a man two ways! The American Mine Door opens and closes automatically in a split second while the trip is in motion. Obviously this "saves a man" from opening doors—saves him from the possibility of accident—saves wages of a man.

The American Mine Door Company specializes in such safety devices. They decrease accidents as well as decrease expense. The American Electri-Throw switch is another mechanism to increase safety and increase speed of hauling.

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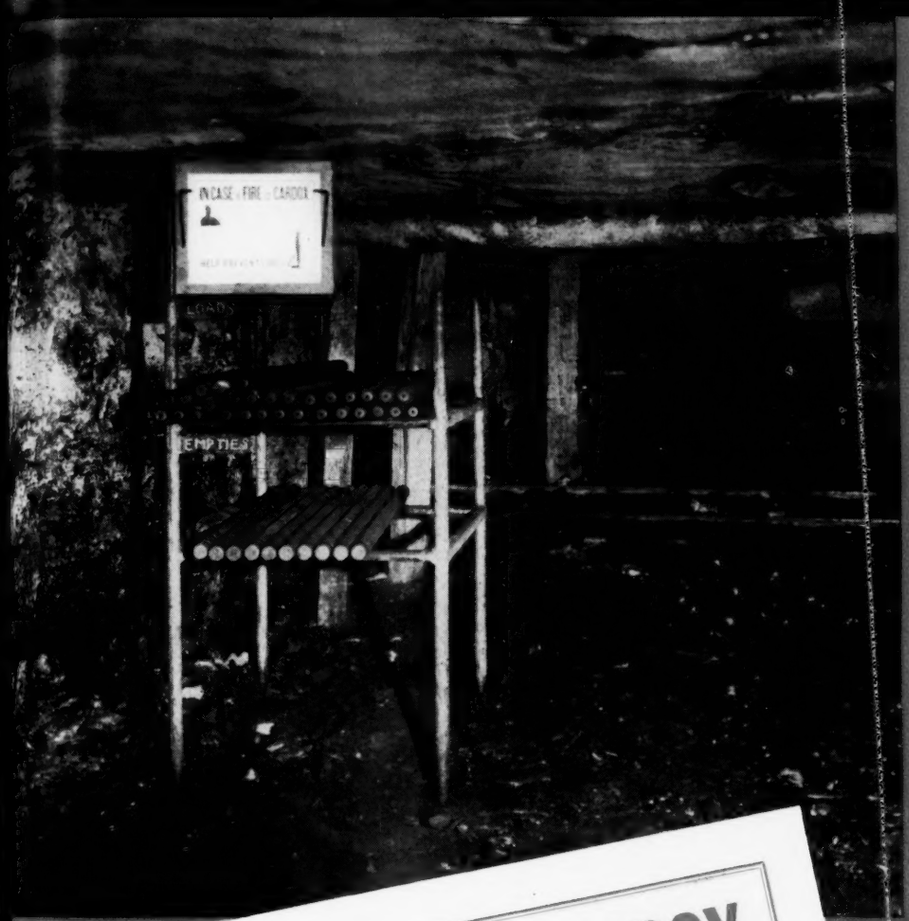
Advertising Forms Close January 15, 1943

CARDOX

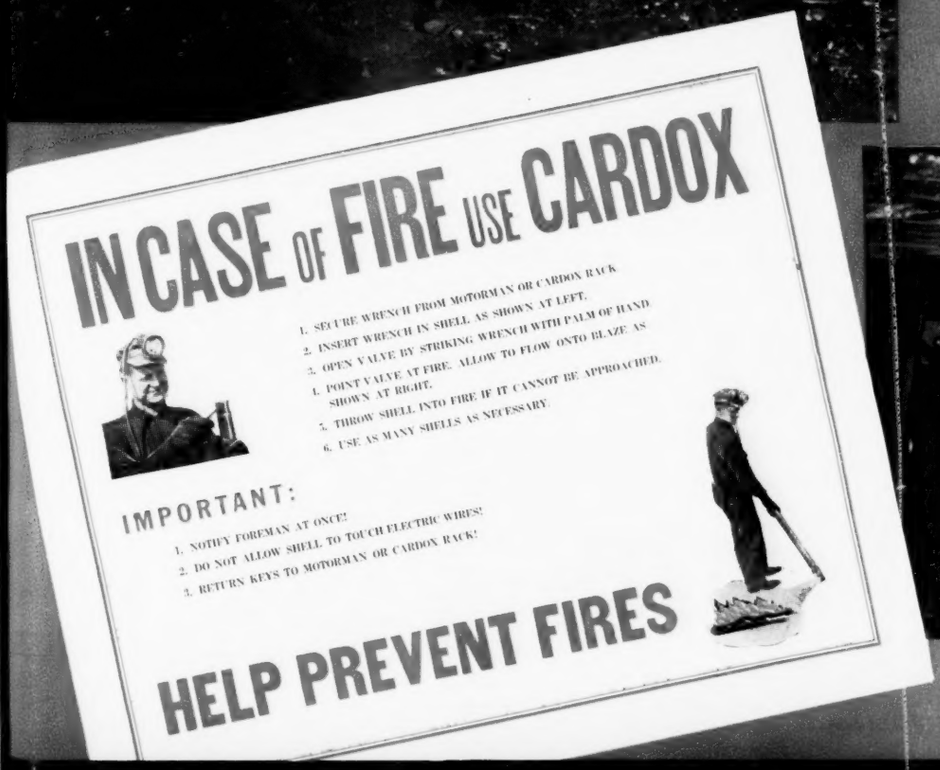
Holds Down 2 Important Jobs



● Operators who adopt CARDOX because of its efficiency and economy in dislodging coal, quickly discover that it is also a highly efficient fire fighter. Consequently, racks of CARDOX Tubes, waiting their turn to go on duty at the working face, are drafted and placarded for emergency duty in case of fire.

Carbon dioxide gas—which generates the slow heaving action which makes CARDOX so superior for breaking down coal, reduces degradation, loading time, timbering costs, and explosion hazards—has exceptional fire smothering and cooling properties. When released from a CARDOX Tube it spreads rapidly and uniformly...even against a strong draft. It penetrates where water or rock dust cannot reach, does not wet or otherwise damage machinery or material with which it comes in contact. Because carbon dioxide is a non-conductor of electricity a CARDOX Tube is ideal for extinguishing electrical fires.

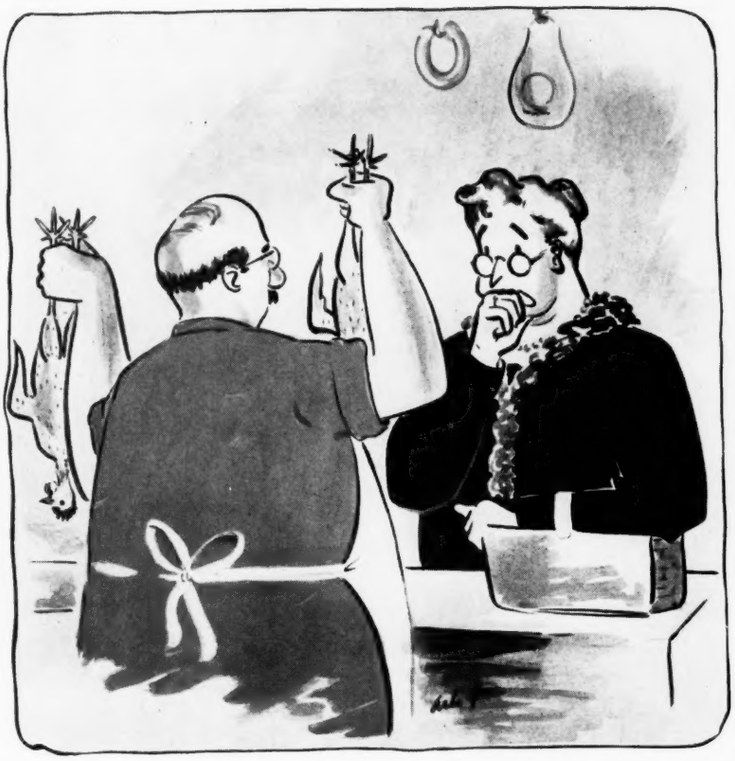
Let us demonstrate CARDOX production and protective advantages by a free test in your mine.


IN CASE OF FIRE USE CARDOX
1. SECURE WRENCH FROM MOTORMAN OR CARDOX RACK.
2. INSERT WRENCH IN SHELL AS SHOWN AT LEFT.
3. OPEN VALVE BY STRIKING WRENCH WITH PALM OF HAND.
4. POINT VALVE AT FIRE. ALLOW TO FLOW ONTO BLAZE AS SHOWN AT RIGHT.
5. THROW SHELL INTO FIRE IF IT CANNOT BE APPROACHED.
6. USE AS MANY SHELLS AS NECESSARY.
IMPORTANT:
1. NOTIFY FOREMAN AT ONCE!
2. DO NOT ALLOW SHELL TO TOUCH ELECTRIC WIRES!
3. RETURN KEYS TO MOTORMAN OR CARDOX RACK!
HELP PREVENT FIRES

Illustrations show a rack of CARDOX Tubes ready for breaking down coal or fire fighting duty, and how a CARDOX Tube is used to extinguish an incipient electrical fire

CARDOX CORPORATION • BELL BUILDING • CHICAGO, ILLINOIS

Economy is a Matter of Knowing How



Aunt Mary knows how to deal with costs. And so does Bituminous Casualty Corporation when it comes to producing economies in Workmen's Compensation insurance.

Bituminous Casualty served its apprenticeship with the conviction that coal mine properties, when handled with certain economies on the part of both insurer and insured, and when cooperating with intelligent, qualified safety engineers, are acceptable and desirable risks. It was a new attitude in those early days—this sympathetic viewpoint.

Thus, by reason of the low operating cost of Bituminous Casualty, by reason of its practical application of coal mine safety and the resultant economies in production costs, Bituminous Casualty Corporation has established an American precedent for so hazardous a line.

It is to Bituminous Casualty Corporation that the country's major coal fields in 22 states look today for protection and a carefully supervised safety program unequalled in the industry.

Insure in a Company that really wants your compensation risks—and knows how to produce economies for you. Write for our plan. No obligation at all.

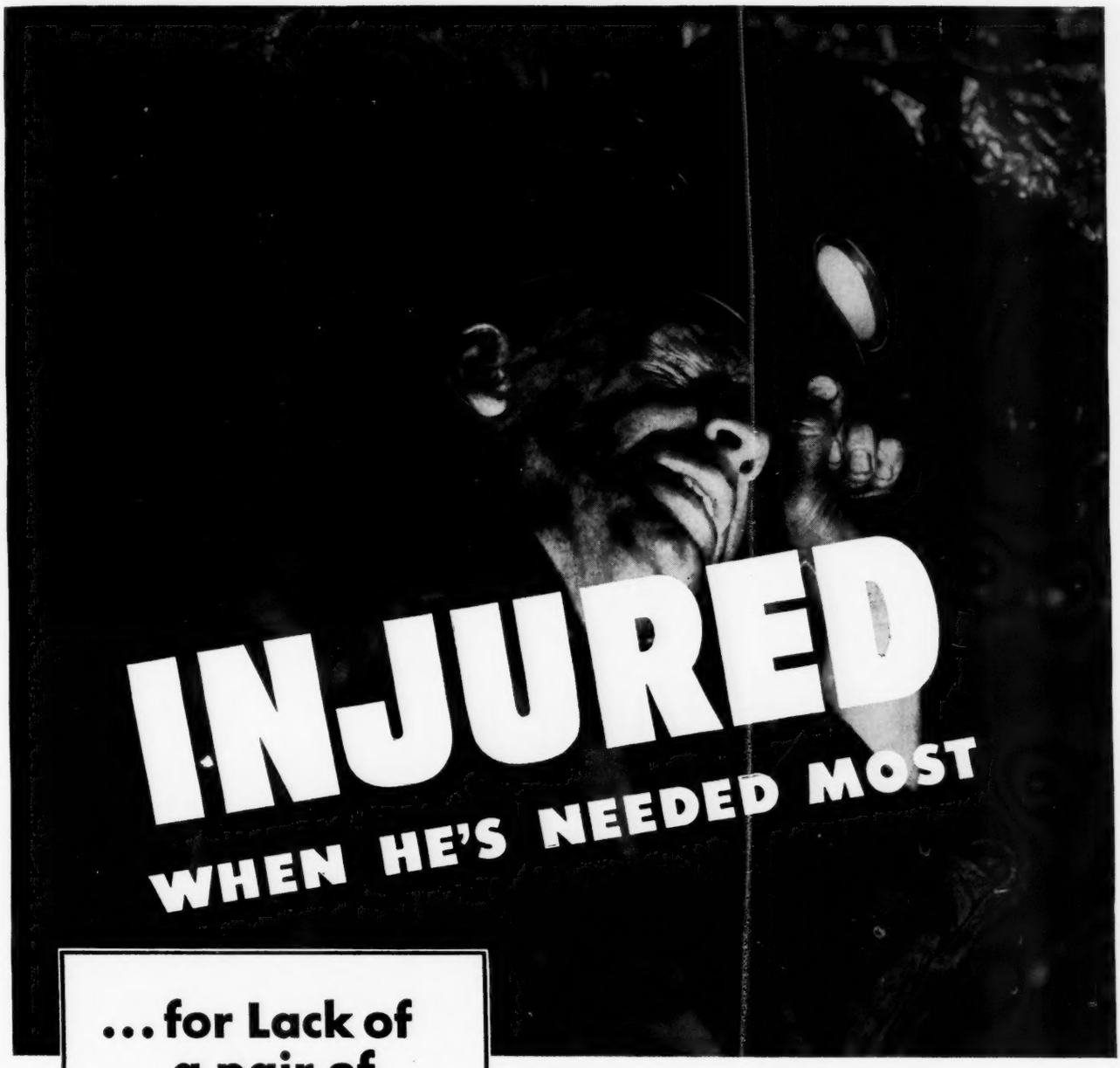
WORKMAN'S COMPENSATION INSURANCE

for a quarter of a Century

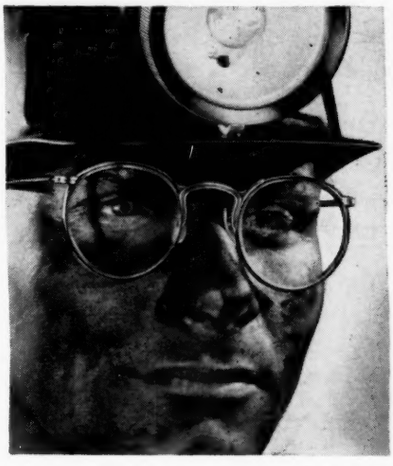
- Over 25 years experience in the field.
- We maintain a modernly equipped Industrial Hygiene Laboratory which is continuously working for the health and security of the men engaged in the mining industry.
- Our staff of mine safety engineers, well qualified in the subject of mine accident prevention, holds the respect of operators, superintendents and miners alike.
- Assets over $9,300,000.00.

BITUMINOUS CASUALTY CORPORATION

ROCK ISLAND ILLINOIS



...for Lack of a pair of GOGGLES



Today, eye accidents that take miners off jobs are costlier than at any other time in the history of your property . . . *because capable miners can't be replaced.* So—today it is more important than ever that miners wear Goggles.

American Optical Company, serving you through Mine Safety Appliances Company, offers you a line of scientifically planned goggles that not only provide *safety* for the eyes but also *comfort* for the face. The AO Ful-Vue is lightweight, *good-looking,* and equipped with Deep-Curved Super Armorplate Lenses that provide maximum possible resistance to impact.

Make the first move towards keeping your men on the job by calling in an M. S. A. Representative today and asking him to show you the complete American Optical Line.

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Tools for producing more coal

The industrial front and the home front need all the coal you can mine. You can't afford to lose one second's production by inefficient blasting.

Build up your production, control your preparation, by shooting with Hercules Permissibles—Hercoal, Red H, Hercogel, and Collier Brands. One of these will shoot your coal efficiently—for either hand or mechanical loading.

An experienced Hercules service man will gladly consult with you in selecting the most effective Hercules Permissible for your mine.

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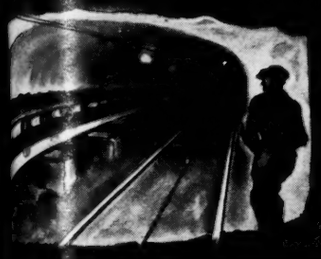


THE FOREMEN'S FORUM

Applied Science at Hazle Brook Colliery Divests Firefighting of Uncertainty*

Hydrogen and Anthracite Fire at About the Same Temperature—Limestone Applied to Anthracite Keeps Away Air, Chokes Flame and Neutralizes Acid—So Control Atmospheres That With or Without Addition of Air They Always Will Be Inexplosive

CAREFUL chemical control at the fire in the Continental mine of the Hazle Brook Coal Co., Centralia, Pa., prevented the hydrogen created by the heating of the anthracite and by the water-gas reaction between the water and the carbon in the coal from exploding, though, prior to such control, a mild explosion occurred.

Coal May Smolder and Yet Not Ignite Gas—A burning substance does not necessarily become involved in flame and a solid may ignite at lower temperatures than will ignite gases, but the difference of temperature, especially with hydrogen, is too small for any comfortable assurance. Table I shows that coal, even anthracite, will ignite at temperatures much lower than will set fire to hydrogen. Carbon monoxide and methane are definitely less reactive than hydrogen and need even higher temperatures for ignition. Bark from a mine post will begin to burn at 437 deg. F., whereas the most susceptible of mine gases, hydrogen, requires 1,085 deg. F. As anthracite will burn at 878 to 928 deg. F., it will not necessarily set fire to any mine gas when burning, provided heat is taken away from the burning coal fast enough that the temperature will not rise to 1,085 deg. F., but the width of the temperature range within which fire will not be communicated from burning anthracite to hydrogen is perhaps only 157 to 207 deg. F.

How Rock Dust Dulls Combustion—To keep down the temperature at Continental mine, limestone dust was played on the combustible materials with a compressed-air-operated rock-duster (1) to shield the coal surfaces from air and (2) so that the fire could spend its energy in raising the temperature of the dust and in breaking down the limestone to lime and carbon dioxide, and (3) so that then that gas would mix with the mine-fire gases and prevent them from burning even when raised to the temperatures at which they would burn when not thus mixed. This dust, if not reduced to lime and carbon dioxide immediately in the presence of flame, might later thus be heated and decomposed and would in any event alkalinize the waters and so save the Schaefer lining from any acid mine-water disintegration. The effect of temperature and of time in determining the quantity of carbon dioxide liberated by calcination of the limestone is recorded in Table II, but the determinations were made under conditions that removed that gas as fast as it was generated, whereas its presence under normal conditions would restrict materially the quantity of gas it would emit.

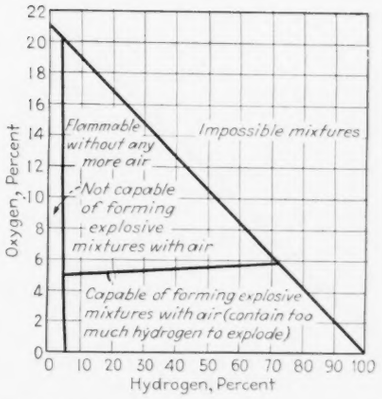
Rock-Duster Does Double Duty—The mine surfaces were rock-dusted by compressed-air-driven equipment such as has

TABLE I—WHEN BURNING BEGINS AND WHEN CARBON-MONOXIDE EMISSION FIRST BECOMES RAPID*

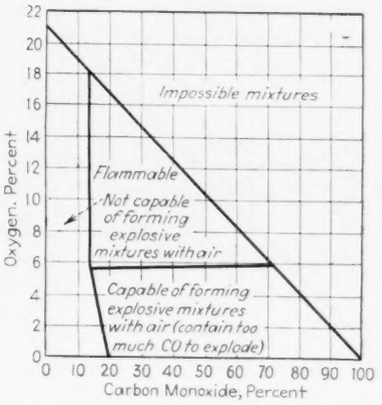
Material	Temperature (Deg. F.) at Which Material Begins to Burn	Temperature (Deg. F.) at Which Carbon Monoxide First Begins to Form Rapidly
Bark from post in chute	437	378
Subbituminous coal, Washington State	454	399
Wood knot	468	407
Sulphur	470	466
Wood	518	513
Bituminous coal, Pennsylvania	620	653
Anthracite slush-bank refuse	815	734
Bone, coal and slate	866	702
High-grade anthracite	878	761
High-grade anthracite	928	
Hydrogen (High-calcium limestone heated one hour begins to decompose 1112 deg. F.)	1085	
Carbon monoxide	1202	
Methane	1202	

TABLE II—EFFECT OF TEMPERATURE AND TIME OF APPLICATION ON LIMESTONE USED AT CONTINENTAL MINE FIRE

Temperature, Deg. F.	Time of Application, Min.	Percentage of Carbon Dioxide Freed of Quantity Present
1112	60	0.80
1202	30	0.80
	60	1.73
1292	15	2.28
	30	4.74
	45	6.20
	60	7.65
1472	15	19.00
	30	34.60
	45	49.45
	60	60.50
1652	2.5	6.15
	5.0	20.31
	10.0	46.15
	15.0	66.85
	20.0	83.50
	25.0	98.15
	27.5	99.70
1832	2.5	23.80
	5.0	61.50
	10.0	98.30
	11.5	100.00


Oxygen, Percent
Hydrogen, Percent
Flammable without any more air
Impossible mixtures
Not capable of forming explosive mixtures with air
Capable of forming explosive mixtures with air (contain too much hydrogen to explode)

How hydrogen and oxygen percentages affect flammability and likelihood of flammation of mixtures of hydrogen, oxygen and nitrogen.

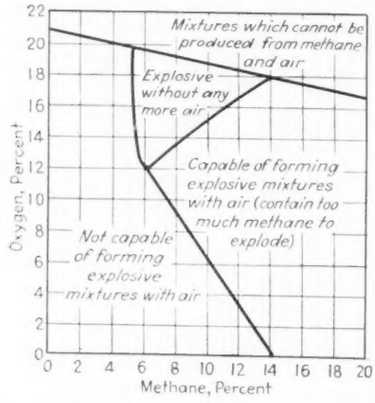

Oxygen, Percent
Carbon Monoxide, Percent
Impossible mixtures
Flammable
Not capable of forming explosive mixtures with air
Capable of forming explosive mixtures with air (contain too much CO to explode)

A mixture of 20 percent of carbon monoxide with 80 percent of inert gases cannot explode, no matter how much air is added thereto.

* Continued from *Coal Age*, November issue, p. 72, a brief of article by S. H. Ash, W. C. Jones and E. W. Felegy read before the Anthracite Section, American Institute of Mining and Metallurgical Engineers by Mr. Ash, then district engineer, U. S. Bureau of Mines, Wilkes-Barre, Pa.

been used extensively in the Pacific Northwest. It resembles the Lamb air foil or the Mine Safety Appliances Co.'s air mover. When operated at low air pressure, it rapidly dusts nearby coal faces and timbers adequately and, when operated at high air pressure, the rock dust is distributed for long distances over gobs, goafs and other inaccessible and high places. It is believed that this is the first time rock dust has been used in the anthracite region to help subdue an underground mine fire.

As already stated, reliance was placed on M.S.A. Hopcalite carbon-monoxide indicators for firefighting, two being available on each shift. One was hand-operated and one was operated by a motor. Not a single severe headache occurred after their installation. In addition, the Bureau men used a M.S.A. supersensitive carbon-monoxide indicator, reading from 5 to 1,000 parts per million. This proved invaluable for tests in the stripping and at points remote from the fire where, though the percentages were very low, accurate determinations were needed.



A mixture of 14.1 percent of methane with 85.9 percent of inert gases cannot explode, however much air it may encounter in its travels.

A hand-operated carbon-monoxide indicator reading from 0.005 to 0.150 percent was purchased by the management during the firefighting operations for testing in the fire area. Since the mine was reopened no carbon monoxide has been found in the workings. Where carbon monoxide could not be maintained below 0.01 percent, no one was allowed to work without respiratory protection. In the construction of the Schaefer archway, air was provided by ventilation ducts.

Probably No Methane in Mine—Hydrogen and carbon monoxide were the gases that endangered lives in the Continental mine fire and not methane, though the Pennsylvania Department of Mines had listed it as a gassy mine. Higher percentages of hydrogen are found in anthracite than in bituminous fires, and hydrogen in burning develops a higher temperature than the gases which are emitted by bituminous coal when heated, so it seems likely that an anthracite fire is more hazardous than a fire in other types of coal. However, the percentage of carbon dioxide generally is higher than in the gases resulting from the combustion of other coals. With hydrogen present, mixtures of flammable gases will explode when in both greater dilution and in greater concentration than with hydrogen absent. For example, because of the quantity of oxygen required to propagate flame in methane, a too high and a too low percentage of the latter gas will prevent it from exploding, but the addition of hydrogen or carbon monoxide to the mixture will make a propagation of flame occur with a higher upper-limit percentage and with a smaller lower-limit percentage of flammable gases than will suffice where the hydrogen is not present; that is, the range of flammability is widened. Every fire must be studied as an individual problem, and samples must be taken from day to day to determine what can be done safely.

In fighting a mine fire, it is necessary not only to guard against gas mixtures that are flammable but against such as may become flammable with additions of air—namely, those higher-limit mixtures that are made non-flammable by the lack of sufficient oxygen. The so-termed "mixture law" declares that where a combustible gas-air mixture that is just flammable at the lower limit is mixed with another combustible gas-air mixture similarly just flammable at the lower limit, the resulting mixture will be just flammable, but Coward, Carpenter and Payman found this was true also of the higher limits, and these facts were used to ascertain just what upper-limit percentages of air or oxygen would be permissible with certain ratios of combustible gases.

Over-All Accident Records May Mislead Us; Why Is Haulage in Iron Pits So Safe?

WHEN figuring accident records, the accidents of any group obviously must be compared with the number of men in that group or the number of man-hours worked by the men thus employed, but, when the number of men or man-hours of the group is not known, these figures cannot be obtained. Because the figures for accidents in transportation are available and the figures for employment are available only for *all* men in the mine operation and because figures for employment of the transportation group are not readily obtainable, such comparisons as have been made have been between transportation accidents and all men employed or all man-hours worked by them, whether the men are engaged in transportation or are otherwise employed. This may be termed a "general," "over-all" or "omnibus" transportation record, and is very misleading.

True, some few men, not transportation men, are killed or injured in transport, but that number might be separately computed or ignored altogether with an error far less than is made when the base of the calculation is all men employed in the mine instead of all men engaged in transportation underground. Clyde L. Lutton (*Coal Age*, August, 1941, p. 56) has asserted that transportation records would be ten times as high if they were made "specific"—that is, if transportation accidents were figured only on the basis of men engaged in transportation.

The erroneous, but perhaps necessary, manner of computation serves fairly well for comparison year for year between mines of the same kind where the number of transportation men bears a like proportion in each case to the whole number of employees, though the ratio varies somewhat from mine to mine of the same class, as also from year to year. However, when comparison is made between underground coal mines and underground mines producing other minerals, there is inevitably a discrepancy, for in some mines more time has to be spent on drilling, shooting and mucking than in coal mines and less on transportation. Consequently the time spent by transportation men is even further dwarfed and their liability to accident thus made less apparent. So comparisons are misleading.

However, the splendid record of the iron mines given by W. W. Adams at the National Safety Congress (p. 84) is hardly to be discounted, for that industry has conditions much like those of the coal industry and has a similar relation between haulage men and total employees and somewhat similar hazards. The coal industry, with rates three or four times as high, should wake up to the desperate situation existing.

With the accident rate so high for transportation workers, when properly computed, it would seem that a given provision of supervision, instruction and regulation should have many times as much effect as such a degree of provision would have on other mine workers unless the injuries result from mechanical defects. In the latter case, the company is really at fault and not the employee. If he is at fault, appeal to him, and control should make him amend. Not only are transportation men few but they also are intelligent and speak English and it should be easy to influence them toward safety. Moreover, they are not, like face workers, exposed to nature-imposed hazards which sometimes neither management nor men can detect. So, at least, for a while, give more time and thought to haulage-accident prevention. A special supervisor in each big mine might justify his appointment.

STATE-BOARD QUESTIONS

Questions Anthracite Inspector Candidates Were Asked, Sept. 2, 1942

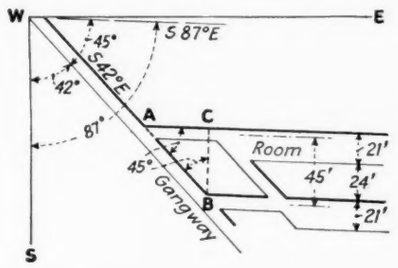
Q.—(a) A gangway in a flat seam with a bearing of S42 deg. E has rooms turned off with center-line bearings of S87 deg. E. If the rooms are 21 ft. wide and pillars between rooms are 24 ft. wide, find correct spacing for the center lines along the gangway.

(b) What is the included angle where the sine=0.70711 and the cosine also is 0.70711?

A.—(a) The directions of both gangway and rooms are in the same southeast quarter circle, so the angle included between them will be 87–42=45 deg. (see illustration.) The distance between center lines is 21+24=45 ft. Let A and B be points on the side of the gangway where the outby sides of two adjacent rooms meet that gangway. Erect a perpendicular from B to the line of the rooms and let it strike the outby side of the outby room at C. This will form a triangle ABC with the angle A and angle B 45 deg. and the angle C 90 deg. Take BC as the base of the triangle and BC÷BA will be the cosine of angle B or cosine 45 deg. and BA÷BC will equal 1÷ cosine 45 deg. =1÷0.70711=1.414. Then BA will equal BC×1.1414 or 63.63 ft., for the distance BC is 45 ft.

Hence the distance between center lines is 63.63 ft., and a good rule to remember is that the room spacing as measured at right angles to the rooms should be divided by the cosine of the angle between the direction of the room and the direction of a line at right angles to the gangway, or in other words to the angle of obliquity of the room from its normal course at right angles to the gangway.

Of course, for the solving of the problem in this manner, it is necessary to know the cosine of 45 deg. and the subquestion (b) was appended to give fillip to the memory though it could be obtained by taking the squares of AC and BC, adding them together and extracting the square root, which in this instance is easy because AC and BC quite evidently are equal. With any other obliquity than 45 deg. this would not be true and ascertaining the length of AC then would be much more difficult without tables and the value of AB would not be easily obtained.



(b) The sine of an angle equals the cosine of the angle only when the included angle is 45 deg. So the answer is that the included angle in this instance is 45 deg.

Scale of Mine Map

Q.—The owner, operator or superintendent of every coal mine or colliery shall make or cause to be made, an accurate map or plan of the workings of such mine or colliery. What must be the scale of this map and what must it show?

A.—The scale must be 100 ft. to the inch and the map or plan must show the workings or excavations in all coal seams and the tunnels and passageways connecting with such workings or excavations. It should state in degrees the general inclination of the strata with any material deviation therein in such workings or excavations and also the tidal elevations of the bottom of every shaft, slope, tunnel and gangway and of any other point in the mine or on the surface where the recording of such elevation is deemed necessary by the inspector. The map or plan must show the number of the last survey station and the date of each survey on the gangways or the most advanced workings, also the boundary lines of the lands of the coal mine or colliery and the proximity of the workings thereto and, if the mine contains anywhere any water dammed back, the dam must be marked on the map with the tidal elevation, inclination of strata, and area of workings containing water.

Height of Water in Mine Dam

Q.—Based upon the rule commonly used in the anthracite region for the required width of a barrier pillar, what head of water will an 88-ft. pillar support if the coal bed has a thickness of 11 ft.?

A.—The rule is "Multiply the thickness of deposit in feet by 1 percent of the depth below drainage level and add to this five times the thickness of the bed." If Y is the head of water that the pillar will support, then $11 \times 0.01 \times Y + (5 \times 11) = 88$, or $0.11Y = 33$, or $Y = 33 \div 0.11 = 300$ ft.

Reversing Bearings

Q.—Give the reverse bearings of the following:

(a) N25 deg. E. (b) N36 deg. 17 min. W. (c) S88 deg. 14 min. E. (d) S2 deg. 46 min. W.

A.—(a) S.25 deg. W. (b) S36 deg. 17 min. E. (c) N88 deg. 14 min. W, and (d) N2 deg. 46 min. E. The accepted practice is to measure angles from the north or south lines and not from east or west lines.

Q.—A line between two survey stations measures 242.5 ft. and a transit sight from one to the other gives a vertical angle of 6 deg. 40 min. What is the true horizontal distance?

A.—The true horizontal distance is the sloping length multiplied by the cosine of the angle or 242.5 ft × cos. 6 deg. 40 min. or 242.5 × 0.99324 or 240.86 ft. This figure for the cosine will have to be given by the examiner or taken from tables.

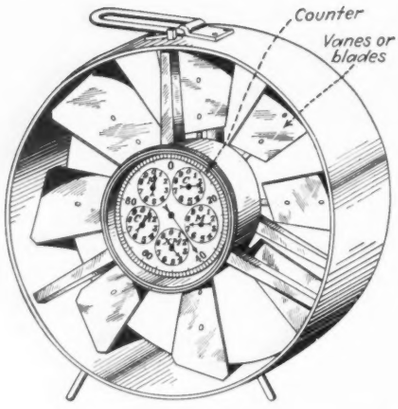
Quiz Presented Applicants for Certificate As Mine Foremen in State of Alabama*

Four Air Instruments

Q.—Describe in detail the part that each of the following instruments plays in coal-mine ventilation: (a) anemometer, (b) water gage, (c) methane detector, (d) carbon-monoxide detector.

A.—(a) *Air-Current Meter* — The blades, or vanes, of an anemometer measure the speed with which the air travels through it, and, the number of revolutions being noted by a counter which is a part of the mechanism, it is possible to determine the speed with which the air is traveling at the point where the anemometer is held. By moving the anemometer slowly to every part of the cross-section of the airway it is possible to

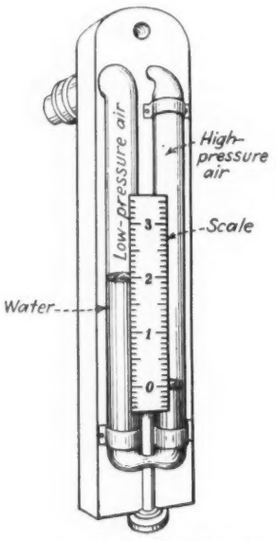
* Continued from November, 1942, *Coal Age*, p. 75.



(a) Anemometer for measuring air speed and thus air volume.

ascertain the average velocity of the air traveling through its entire cross-section. An anemometer, therefore, determines air speed.

(b) *Air-Pressure Meter*—A water gage is a U-tube, partly filled with water. The water in the two legs of the *U* normally would be level, but, as the end of each leg is connected with the air on its side of the instrument, the water is lowered in the one leg by the heavier of the two air pressures and accordingly rises in the other, the difference being the weight of



(b) Water gage to determine pressure differences.

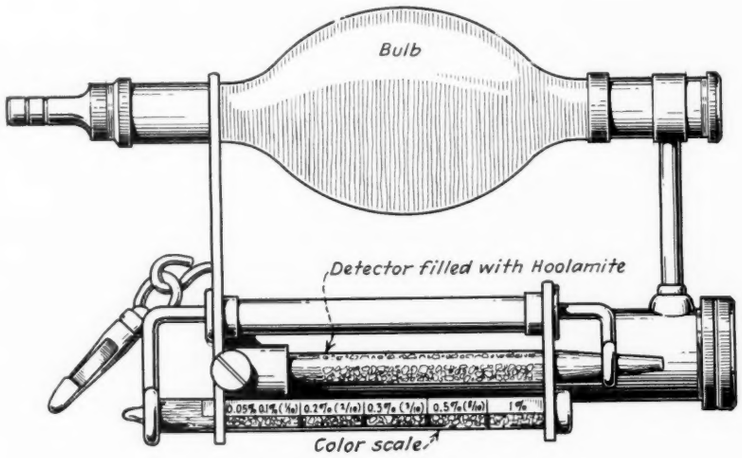
inches of water, or the "water gage." A tube from the top of one leg of the water gage usually is passed through a stopping in a crosscut and thus the difference of pressure is that between the intake and return air current at that particular point. A water gage therefore measures difference of air pressure in inches of water.

(c) *Methane-Percentage Meter* — A methane detector indicates percentages of methane in the air at the point where samples are taken, even when these percentages are relatively small. Practically all methane detectors now in service include a Wheatstone bridge, an electrical hook-up of resistances operating on the electrical principle that if electricity can travel along either of two paths, or wires, to reach a given point, if the resistance is greater along one path, or wire, than along the other, less current will travel along the first path than along the second, and the difference will be apparent on a sensitive amperemeter ("galvanometer") if connected to the two paths by a wire joining them.

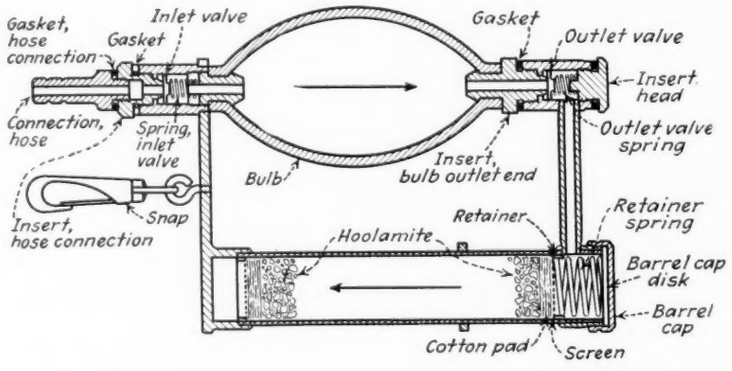
Electric current is supplied by a cap-lamp battery or by dry cells, which current heats a threadlike platinum wire (known as a "filament") to a definite working temperature and, when it is at that temperature, the two paths have an equal resistance and the galvanometer registers zero.

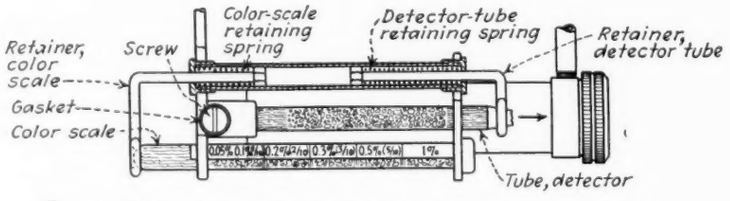
When the glowing filament, which is called a "detector unit," gets into air containing methane, it causes the latter gas to burn, and the combustion, in turn, further heats the filament, thus increasing its electrical resistance, for the hotter the wire the more difficult it is to send electricity along it. This change in resistance reduces the current in that path which includes the filament, and this decrease in current has its effect on the galvanometer, the indicator of which moves around on the dial in proportion to the quantity of methane present. The figures on the dial are not marked to show current differences but differences in percentage of methane; in consequence, that percentage can be read without any understanding of the method of operation of the apparatus and without making any calculation.

(d) *Hoolamite Carbon-Monoxide Meter* —One form of carbon-monoxide detector, sometimes known as the "iodine-pentoxide" or "Hoolamite" carbon-mon-



Carbon-monoxide detector, exterior view.





Cross-section; arrows show direction in which air sample travels.

oxide detector, shows the quantity of carbon monoxide in the air to which the detector is exposed, provided it does not exceed 1 percent. "Hoolamite" is a chemical mixture of iodine pentoxide and fuming sulphuric acid on granular pumice stone inclosed in a glass detector tube hermetically sealed until ready for use. The complete detector includes a metal barrel filled with activated charcoal through which air is made to pass by alternately squeezing and withdrawing pressure from a rubber bulb. This activated charcoal removes all foreign gases that are present, except carbon monoxide.

When air containing that gas is passed through the detector tube attached to the barrel containing the activated charcoal, iodine is liberated from the "Hoolamite"; this changes the originally white granules to a bluish green of increasing intensity, depending upon the concentration of the carbon monoxide. After the bulb has been squeezed and released ten times, the color in the detector tube is compared with a series of bottles each having a standard color shade, the set forming what is known as a "color scale," which is part of each instrument. This scale has the color shades in it so arranged that they correspond to the intensity of color of the "Hoolamite" after exposure to a definite quantity of air having a definite percentage of carbon monoxide; thus the figure on the bottle when read gives the observer the correct concentration of carbon monoxide in the air sample.

Blood-Carbon-Monoxide Meter — Another carbon-monoxide detector is known as the "Pyrotannic Detector," which may be used for determining the quantity of carbon monoxide in the blood or in the air. To ascertain the quantity of carbon monoxide in an air sample, a solution of blood is exposed to the sample and then treated with pyrotannic acid. The resultant liquid is then compared with a graduated set of color standards, each of which has been arranged to correspond to the intensity of color of blood having some one definite quantity of carbon-monoxide-hemoglobin. When the percentage of blood saturation with carbon monoxide is determined by a comparison of the sample with the color standards, this information can be used to ascertain the percentage of carbon monoxide in the air by reference to graphic curves developed for this express purpose.

The pyrotannic acid method is an efficient and accurate means of determining the quantity of carbon monoxide in air, although the maximum concentration that can be determined is limited to only 0.2 percent. Should higher concentrations of carbon monoxide be present, other means of detection—such as the "Hoolamite" carbon-monoxide detector—may be used.

Carbon-Monoxide Indicator—A more recently developed instrument for determining low concentrations of carbon monoxide in air is the carbon monoxide indicator, in which carbon monoxide in an air sample is oxidized to carbon dioxide by the action of a chemical catalyst, "Hopcalite." Heat liberated by this oxidation is directly proportional to the quantity of carbon monoxide present and is measured by a series of thermocouples in series with an indicating electric meter. The meter is calibrated to read directly in percentage of carbon monoxide, and the usual scale range is from 0 to 0.15 percent graduated in divisions of 0.01 percent.

How Air Is Conducted

Q.—(a) What are the essentials necessary to conduct air on its course through the mine? (b) Explain fully how you would determine when a mine is adequately ventilated.

A.—(a) For the proper conduct of air through a mine, stoppings or brattices, doors and regulators are essential. The first three should be tight.

(b) A mine is adequately ventilated when it delivers to every man's working place the quantity of air required by law and when in addition it dilutes all the noxious and dangerous gases in the mine so as to make them harmless. But as gases, even in well-managed mines, sometimes gather in parts of the mines not being worked and difficult to ventilate, another requirement is that no condition shall exist that will displace so much noxious gas as to make safe atmospheres unsafe, also that no temporary derangement of the ventilating current shall be able to have a like result. To guard against this possibility the percentage of methane must be kept always well below the explosion point, stoppings must be made too strong to crush or fail, doors in gassy mines should be provided in pairs, and arrangements made not to carry methane from roof falls from one pillar working to another. Instead the air should be arranged to pass by bleeders to the return airway of another entry.

Queries Posed Candidates for First Class Mine Foremen's Certificates in Kentucky*

Man-Hoisting Protection

Q.—What condition of maintenance is required for hoists used for lowering or hoisting persons?

A.—They shall be inspected once every month ..... ( )
They shall be inspected twice each month ..... ( )
They shall be kept free from dirt and grease ..... ( )
They shall be inspected daily.... (X)

[Sec. 21 requires that "the hoisting rope, the safety catches and the cage attachments shall be examined by the mine foreman or some competent person designated by him every morning before the men descend into the mine."]

Removal or Sealing of Gas

What are the requirements relative to removal of dangerous gases?

They shall be diluted, rendered harmless and carried away..... (X)
They shall be properly sealed from active workings..... (X)
They shall be diluted by efficient rock-dusting ..... ( )
They shall be carefully removed in all haulways so far as the trolley wire extends..... ( )

[Sec. 19 requires that all mines shall have at least 100 cu.ft. of air per minute for every person employed in the mine and 200 cu.ft. of air per minute for each animal and that this air shall be circulated around main headings, cross headings, room headings and working places to an extent that will dilute, render harmless and carry off any noxious and dangerous gases therein. In a mine liberating explosive gas, these quantities shall be increased to 150 cu.ft. for persons and 300 cu.ft. for animals.

["All unused workings and abandoned parts of the mines must be protected by such safeguards as will prevent, so far as practicable, the accumulation or overflow of gas therein." What that really means is not clear. It seems to permit of sealing, though sealing does not prevent accumulation of gas, but does prevent overflow. It would appear that if accumulation cannot be prevented, overflow must be, and that can be attained by sealing. For this reason, the second requirement has been marked with a cross.

[Rock-dusting is not required by law to be applied as a defense against methane, but only as against coal dust, though it has value in that direction. Special care should be taken to remove methane from all haulways where trolley wire is present, because the arcs that the electricity causes are near the roof where pockets or laminations of gas are likely to be present. One might reasonably mark with a cross all four requirements stated in the question, two on both legal and physical grounds and two on physical grounds alone.]

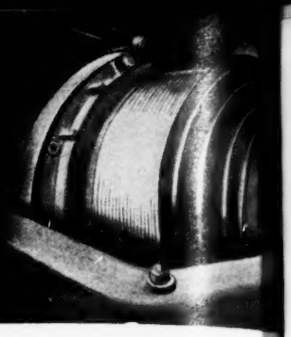
Inspector's Orders

What is the duty of the operator, agent, superintendent or mine foreman as to written instructions issued by district mine inspector?

To follow them, provided cost is not excessive ..... ( )
To see that they are posted in a conspicuous place ..... ( )
To check accuracy of the findings.. ( )
Not to permit any person to work in violation of such instructions.. (X)

* Continued from November, 1942, *Coal Age*, p. 75.

TIPS FROM MANUFACTURERS



Gas Mask

Acme Protection Equipment Co., Inc., Pittsburgh, Pa., offers the improved Acme full-vision all-purpose gas mask, now carrying the U. S. Bureau of Mines permissible plate and said to combine protection against carbon monoxide and other gases with complete protection against smoke.

According to the maker, the Acme mask gives full vision, including downward; has clear lenses, free from fogging or steaming, and has gas-tight fit without uncomfortable pressure. An automatic timer shows the wearer at a glance how much of the service life of his canister has been used up and how much remains.

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Arc-Welding Prizes Offered

To further interest in arc-welding generally and to give recognition to those who are doing their part in expediting production by the use of arc-welding, Metal & Thermit Corp., New York City, has been running a contest for photographs and descriptions of welded work. Three hundred dollars in War Bonds and Stamps were offered for the best selections received during July, September and November.

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A.C. Welding Electrode

A new a.c. transformer-type welding machine, the "Bumble Bee," said to combine exceptional safety with improved operating efficiency, is offered by Wilson Welder & Metals Co., Inc., New York City. Portable and streamlined, its 18-in. width permits easy passage through narrow doors. It has dual voltage connections for either 220 or 440 volts and thermal overload protection provided by a cutout coil buried in the winding.

Two primary coils are used instead of the usual one, with a magnetic contactor in the circuit of one primary. Each primary contributes about 42 volts to the total open circuit voltage, which actually is 84 to 85 volts. However, when the machine is idle one primary is automatically cut out, restricting the open circuit value to 42 volts. As soon as the electrode contacts the work, the second primary is thrown into the circuit, and if there were not a dead short, the voltage would be 84-85.

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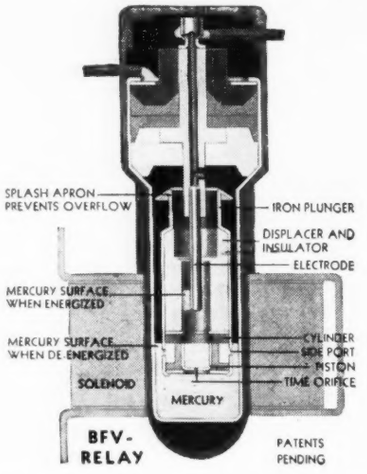
Time Delay Relays

Durakool, Inc., Elkhart, Ind., offers the Series BFV Durakool timer, adapted to modern communication systems, machines, motors and electrical circuits wherever time intervals are required at beginning or end of cycle, also to recycling operations or flasher actions. The BFV series provides slow closing, quick opening and instant reset of contact, using a single relay unit, in addition to slow closing, slow opening contacts and quick closing, slow opening contacts.



To keep time delay settings accurate, it is important that no burning apart of contacts shall occur, as this changes the time settings. By introducing a non-oxidizing pressure atmosphere of inert gas, flaming is eliminated and time settings remain constant. Because this high-pressure gas cools and quenches arcing, these relays are recommended wherever, dust, dirt, moisture and explosive fumes are hazardous to electrical contacts. Capacities range up to 75 amp., with solenoids wound for any voltage and frequency.

Dust Respirator

To save metal for war production, the M.S.A. Comfo dust respirator has been redesigned with filter cases of black plastic, announces Mine Safety Appliances Co., Pittsburgh, Pa. The unit now offers better appearance plus less resistance to air flow, according to the manufacturer. The new filter container units are thinner, with rounded edges, permitting even better sidewise and downward vision.

The redesigned plastic filter cases have high impact strength with no electrical conductivity. They are not affected by perspiration. The field-proved plastic model has twin side-placed replaceable filters of unusually large area, easy to clean and maintain, and is available in types to meet various dust and mist conditions.

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New Way to Install Crossbonds At Switch Points

"The next time you crossbond that turnout into No. 9 North or other switching points on your trackage, here's a new wrinkle that'll save you both installation time and money—make a neater looking job, too," says a recent issue of *O-B Haulageways*. "Instead of the usual practice of using three bonds, as shown in Fig. 1, just take two regular crossbonds, using one between rails 2 and 4 and the other between rails 1 and 3 (Fig. 2). Then connect the two bonds with a standard . . . three-bolt feeder clamp . . . and you've got a crossbond that's tight and efficient, both mechanically and electrically. Two less terminals to put on means speedier installation time, less chance for human error.

"The two bonds alone provide an elec-

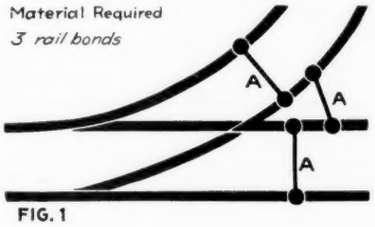


FIG. 1

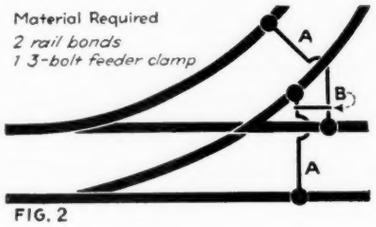


FIG. 2

THESE are the real footsteps to Victory . . . the marching feet of fighting men, now heard across the embattled continents. Yet these men cannot fight unaided. Each step a soldier takes needs the fullest backing here at home. We must sacrifice, we must work, we must save.

Here, for example, are four very simple conservation steps which you can take on the march to final victory. Follow them and make your storage batteries last longer. Buy to last, and save to win!

STEP No. 1 Keep adding approved water at regular intervals. Most kinds of local water are safe in an Exide Battery. Ask us if yours is safe.

STEP No. 2 Keep the top of the battery and battery container clean and dry at all times. This will assure maximum protection of the inner parts.

STEP No. 3 Keep the battery fully charged—but avoid excessive overcharge. There's always a right way to do any job, and a storage battery will last longer when charged at its proper voltage.

STEP No. 4 Keep records of water additions, voltage, and gravity readings. Don't trust your memory. Write down a complete record of your battery's life history. Compare readings. Know what's happening!

If you wish more detailed information, or have a special battery problem, don't hesitate to write to Exide. We want you to get the long-life built into every Exide Battery. Ask for Booklet Form 1982.

THE ELECTRIC STORAGE BATTERY CO., Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

Exide
IRONCLAD
BATTERIES

trical connection between the two tracks. However, the addition of the feeder clamps gives another point of equalization as well as an effective interconnection between all four rails.

"Crossbonding the four rails at a switching point is generally recognized as being desirable. While the two 'outside' rails usually provide a continuous, well-bonded path through a switch, the 'inside' pair, unless properly crossbonded, add little to the return circuit, due to their special castings and moving parts.

"And don't forget that for an adequate face voltage, crossbonds installed at 200- to 300-ft. intervals along your entire haulageway is a mighty good practice, too. Then if one of your joint bonds should be destroyed, the adjacent crossbonds will tie the two rails together again and the effective resistance of the two rails will not be lost."

Streamlining Switchgear Transactions Speeds Ordering and Installation

"PROPOSAL routine and ordering routine, real time consumers in negotiations for plant equipment, have been effectively speeded up in many transactions for switchgear," states E. H. Beckert, switchgear division, General Electric Co. "Depending upon the type of equipment involved, savings up to 50 percent are being made in the purchaser's and manufacturer's time previously required to decide on the switchgear needed for a job, order it and get it into production.

"Two factors are responsible for the saving. One is standardization of equipment, already accomplished by leading switchgear manufacturers. Without it, the scheme would be unworkable. Factor two is double-barreled and involves, first, the use of a one-line diagram by the purchaser in his request (Fig. 1) and, second, the use of a combined one-line diagram and perspective outline picture of the equipment by the manufacturer in his proposal (Fig. 2).

"This method short-cuts the preparation of detailed specifications by both the purchaser and manufacturer. It also eliminates much of the proposal routine preliminary to the actual placing of the business and often a great deal of correspondence after the order is received.

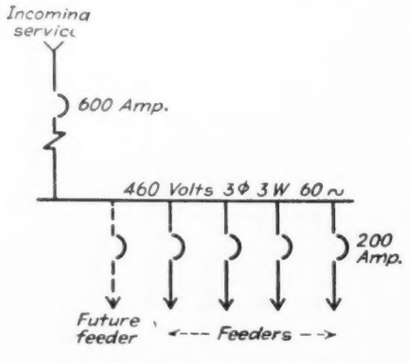
"A typical case will illustrate how the new method works:

"The XYZ Mfg. Co. plans to erect a small plant and needs switchgear to control and protect the distribution system. To begin with, the engineer on the job, of course, knows the total amount of power required and he must select the system of distribution he desires to use and the distribution voltage. He must know where his load centers are to be located and the capacity of the feeders for each of these centers.

"In the simple case chosen it is assumed that the size of the plant is such that the engineer decides to distribute power at low voltage with the stepdown transformers located outside the plant. He wishes to control the incoming service and four feeders to load centers with space on the switchgear control board for a possible future feeder. (The one-line-diagram scheme could be applied equally well had he decided to distribute at high voltage with stepdown transformers at load centers, using the unit substation system.)

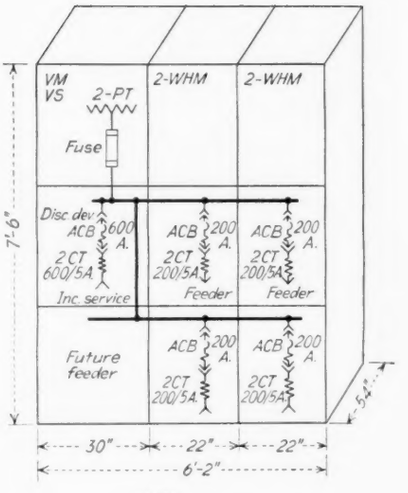
Having made these decisions, it takes the engineer a very short time to make up a simple one-line diagram (Fig. 1). This diagram contains data as indicated and is accompanied by very brief general specifications stating essential information applying to the specific conditions of the purchaser's installation. This constitutes specifications and request for a proposal.

"The manufacturer readily determines the standard equipment applicable and prepares his bid. This consists of: (1) a letter quoting prices and estimated shipping date; (2) a drawing (Fig. 2), which is a dimensioned perspective outline of the equipment containing a one-line diagram showing the connections of each unit with a keyed list of each unit's equipment; (3) a set of stock descriptive sheets that describe details of the equipment offered; and (4) a set of brief specifications containing only such general essential data as machine and circuit capacities, general reference to descriptive sheets and a limited amount of other data not easily covered in the drawing.



1—Watt-hour meter on each feeder
VM and 3Φ VM switch on incoming serv.
Interrupting rating required for cir. brs., 25,000 Amp.
Finish — Manufacturer's standard

Fig. 1—Customer's request diagram.



KEY

VM – Voltmeter, type —
VS – 3Φ Voltmeter sw.
WHM – Drawout, Watt-hour meter 3Φ 2-coil, type —
PT – Potential trans. 460/115 V.
ACB – Air circ. br. tp. 600 V. drawout type, man. oper. 3 trip on service br. inst., type — 2 trip on feeder br. time, type —
CT – Current trans.

Fig. 2—Manufacturer's proposal diagram.

"XYZ Mfg. Co. then places its order in a form as simple as 'One switchgear equipment in accordance with Proposal No. so-and-so.' In completing the order, of course, the manufacturer provides the usual drawings, including front view and complete wiring diagram for operating purposes. But their preparation is coincident with the manufacture of the equipment and not a part of the negotiations.

"This question may be asked: 'Doesn't the one-line-diagram method mean that the purchaser is putting himself pretty much in the hands of the manufacturer?' The answer could be 'Yes' but it should be 'No'—'Yes' because this method places a larger share of responsibility on the manufacturer and takes for granted the suitability of his standard equipment; 'No' because, after all, no real details are left open, since standard equipments are furnished and these are very definitely described in the diagram and in the stock construction sheets submitted with the proposal. All manufacturers in a transaction of this kind will take pride in safeguarding the customer's interests and in furnishing equipment that will fulfill all requirements."

Time-Saving Ways to Speed Production Include Variety of Short Cuts

A WIDE variety of short cuts for speeding production are included in a recent release of the Westinghouse Electric & Mfg. Co. Selected examples are as follows:

Drilling Thin Sheets—Drills are ground with a flat spur point (Fig. 1) and show a marked advantage over drills ground in the conventional manner. Benefits include less burr, improved chip clearance.

Removing Broken Stud or Tap—A nut is welded on tool, or stud, broken off in casting or fabricated part. The nut, same size as broken piece, is filled with weld metal (Fig. 2) to make a solid unit. Flux from welding rod prevents freezing to casting surface. This method saves time and material, reduces scrap. It is success-

YOU CAN DEPEND ON KING

● Production for victory has unquestioned priority. While this may cause some inconvenience and sacrifice in filling orders, we know that it has the unqualified endorsement of everyone with whom America comes first.

But you can still depend on King for your complete explosive requirements —

Red Crown, the sensational new surface sensitized permissible, other King permissibles in complete range of speeds and stick counts, King Pellet Powder and King Detonite.

THE KING POWDER CO. INC.
CINCINNATI, OHIO
INCORPORATED 1878

ful in removing taps as small as 4-40. Practicability depends upon the cost of the casting.

Preventing Soldering Iron From Burning Out—When not in use, tip of iron remains in housing (Fig. 3). Thermostat control in housing disconnects iron when it begins to overheat. Life of the soldering iron is increased and correct temperature is maintained.

Connecting Pipe—Malleable iron sleeve fits over pipe ends (Fig. 4). Nuts on each end, when tightened, compress rubber gasket around end of each pipe. Stands pressure of 150 lb. per square inch. Handles oil, gas, heated air, water and other fluids. Eliminates threading. Saves time.

Testing Electrical Circuits—Unstripped circuit wire dipped in mercury wells or electrolytic salt solution in contact with wells conducts current for testing short and open circuits (Fig. 5). Speeds testing 30 percent and cuts operating costs 30 percent.

Opening Cotter Pins—End resembling screw driver blade is cut out, leaving two prongs (Fig. 6). One prong is rounded to fit the eye of the cotter pin. The other prong is flattened to facilitate opening the pin. Saves time and speeds production.

Lighting Deep Holes and Other Recesses

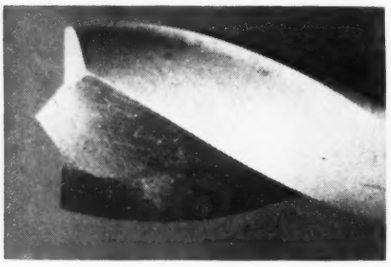


Fig. 1—Drill for thin sheets.

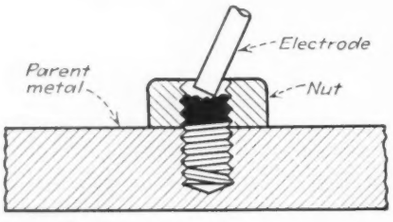


Fig. 2—Removing broken tap or stud.

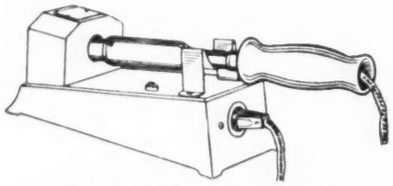


Fig. 3—Soldering-iron stand.

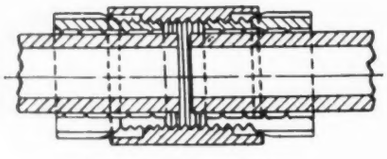


Fig. 4—Pipe connection.

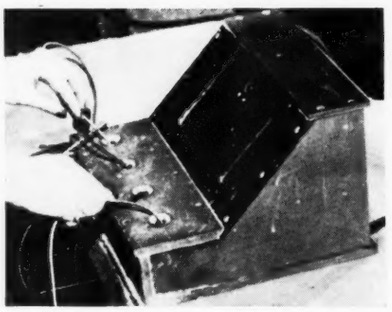


Fig. 5—Circuit tester.

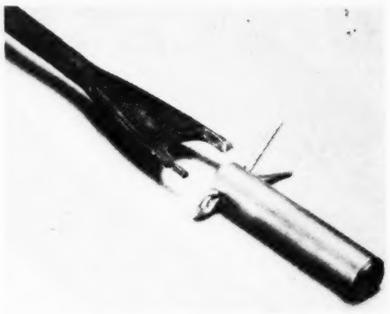


Fig. 6—Tool for cotter keys.

Fig. 7—Flashlight extension.

—To aid inspection and machining operations, an extension is attached to a flashlight. This extension (Fig. 7) consists of an 18-in. length of copper wire inside an aluminum tube. The male threaded part on one end of the tube screws into the regular bulb socket. The opposite end has a bulb socket attached. The extension is flexible and may be straightened without injury. The unit operates in the conventional manner.

•

Industrial Notes

KEYSTONE CARBON CO., Saint Marys, Pa., has appointed George B. Shaw as sales engineer. A graduate of St. Francis College, he is devoting his efforts to promotion of Keystone negative temperature coefficient resistance material, which is a recent development of the company.

HERSEY & CO., Seattle, Wash., has changed its name to American Ventilating Hose Co., effective Nov. 2.

HAZARD INSULATED WIRE WORKS Division of the Okonite Co., Wilkes-Barre, Pa., has been awarded the Army-Navy "E" for production achievement.

OWENS-CORNING FIBERGLAS CORPORATION, Toledo, Ohio, observed on Nov. 6 the fourth anniversary of its founding together with the unfurling of the Army-Navy "E" award for production performance at its factories in Newark, Ohio, and Ashton, R. I.

THE MARITIME "M" Pennant and Victory Fleet Flag has been awarded to Wickwire Spencer Steel Co.'s Palmer Plant, Palmer, Mass., for "outstanding production achievement" on cables and riggings.

GORMAN-RUPP CO., Mansfield, Ohio, manufacturer of pumps, organized in 1933, has acquired and is occupying larger quarters consisting of two factory buildings, one 100x400 ft. and the other 60x100 ft.

MACWHYTE CO., Kenosha, Wis., received the Army-Navy "E" award on Nov. 21 in recognition of its excellence of production.

AHLBERG BEARING CO., Chicago, has appointed Charles Nelson Jr. to be chief engineer in charge of bearing design and development work. Following his graduation from Armour Institute he joined the engineering staff of Marlin-Rockwell Corp., where he remained until 1931, when he joined Ahlberg. In 1933 he was appointed assistant chief engineer.

THE NEW Mississippi plant of the LeTourneau Co. of Georgia, 12 miles south of Vicksburg, was dedicated on Nov. 28. The exercises, lasting all day, included addresses by State and national leaders, War Bond sale, band concert and an old-fashioned Southern barbecue for 10,000 persons.

THE ARMY-NAVY "E" award was presented to the Bucyrus-Erie Co.'s South Milwaukee (Wis.) plant on Nov. 7.

•

Trade Literature

BLOW TORCHES—Turner Brass Works, Sycamore, Ill. Two-color wall chart entitled "Know Your Blow Torch" shows all parts of a blow torch with labels and gives lighting instructions and safety hints in action pictures.

COPPER CONSERVATION — Delta-Star Electric Co., Chicago. Because the war necessitates conservation of our resources and delay in securing materials and shortage of man-power are forcing a revival of interest in open wiring up to 600 volts for industrial plants, Booklet 4210 examines this type of construction from the standpoint of best use of copper.

DRILLS AND TOOLS—Black Drill Co., Cleveland, Ohio. Booklet gives a few brief facts about "Hardsteel" in drills, reamers, tool bits and special tools. There are sections on applications, drill speeds, drilling procedure, use of jigs and coolants.

EARTH MOVERS—Lima Locomotive Works, Inc., Lima, Ohio. Booklet entitled "Timely Tips" gives useful information pertaining to the servicing and operation of excavating equipment.

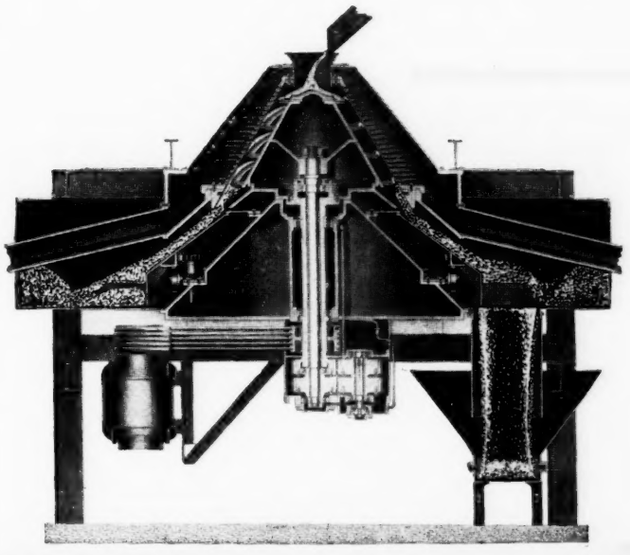
LUBRICATION — South Bend Lathe Works, South Bend, Ind. Bulletin en-

"C-M-I" Continuous Centrifugal DRYER

Valuable HELP PARTICULARLY FOR THESE TIMES

Conserves MATERIALS, POWER and TIME

THE finer sizes of your coal are delivered so dry that no freezing in transit nor clogging of bins, spouts, and cars occurs. Thus, much time is saved in putting clean dry coal in your customers' bins or stock piles.



Also, by using the "C-M-I" Continuous Centrifugal Dryer, sludge and slurry coals may be reclaimed and used for special purposes or mixed with larger sizes.

CENTRIFUGAL AND MECHANICAL INDUSTRIES, INC.

SECOND AND PRESIDENT STREETS ST. LOUIS, MO.

SCHICKLGRUBER SMILES

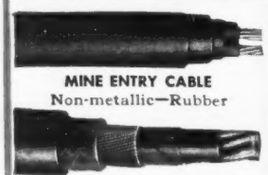
...whenever a portable cable is used as a tow rope or otherwise abused because it means...a lot of valuable copper and rubber will be put out of service by *premature* cable failure...less coal going out to speed America's Victory.

Your Roebling Cables are built to defy unusually rough service conditions. BUT, if protected against accidental damage and unnecessary abuse they will last much longer. For example: (**1**) Avoid severe kinking and cutting when dragging. When moving cable, reel up if possible; (**2**) Don't let cable soak in water. It takes but a second to flip it over out of a puddle; (**3**) Wipe thoroughly and reel up or coil loosely when wet, to speed drying out; (**4**) Repair damaged cables by trimming back to sound sheath and patch-vulcanize; (**5**) Set up periodic inspection of all portable cables; (**6**) Train *all employees* for routine care and repair of rubber insulated cables.

JOHN A. ROEBLING'S SONS COMPANY
TRENTON, NEW JERSEY
Branches and Warehouses in Principal Cities

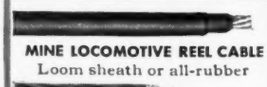
JR ROEBLING

ROEBLING MINE WIRES AND CABLES HAVE ENLISTED FOR THE DURATION!



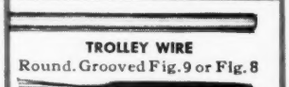
MINE ENTRY CABLE
Non-metallic—Rubber

MINING MACHINE CABLE
Loom sheath or all-rubber

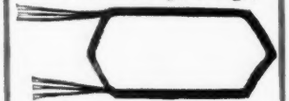


MINE LOCOMOTIVE REEL CABLE
Loom sheath or all-rubber

BORE HOLE CABLE
Rubber or Varnished Cambric Round Wire Armor



TROLLEY WIRE
Round, Grooved Fig. 9 or Fig. 8



ARMATURE AND FIELD COILS
For Motor Repair

* * * PROMPT SHIPMENT TO MEET ESSENTIAL NEEDS * * *

ROEBLING
ELECTRIC WIRES AND CABLES

titled "Oiling the Lathe" strongly emphasizes the importance of proper lathe lubrication in maintaining maximum performance and accuracy.

METAL-CLAD SWITCHGEAR — Roller Smith Co., Bethlehem, Pa. Catalog 1110 on horizontal drawout metal-clad switchgear in 100,000-, 150,000- and 250,000 kva. capacities at 5,000 and 15,000 volts, points out advantages in safety, reliability and ease of installation and maintenance. Construction details are described and illustrated; complete dimensional data on the various types of gear available also are included.

MULTIPLE V-BELT DRIVES—Multiple V-Belt Drive Association, Chicago. Booklet, "23 Ways to Conserve the Life of Your Multiple V-Belt Drives," presents material on the proper selection, installation and maintenance of multiple V-belt drives to obtain maximum life.

POWER TRANSMISSION—American Pulley Co., Philadelphia, Pa. Catalog ED-42, on American Econ-O-Matic drives, dealing with both V-belt and flat-belt drives, includes data on motor-base mountings for special applications. Illustrations and case histories of typical power-transmission installations are featured.

REDUCTION DRIVES—American Pulley Co., Philadelphia, Pa. Catalog of American reduction drives emphasizes their ease of installation—they mount right on the shaft of driven machine. Made in six sizes from ½ to 25 hp., and with a standard speed ratio of 13 to 1, they deliver any desired driven speed from 11 to 154 r.p.m.

SQUIRREL-CAGE MOTORS — Allis-Chalmers Mfg. Co., Milwaukee, Wis. New "Motor Finder" aids in quickly selecting various types of squirrel-cage motors. With the "Motor Finder" slide-rule, the motor user, it is said, can match the conditions under which the motor must operate at the proposed installation with the required motor characteristics and instantly learn the right motor type and its features.

SHOVEL, DRAGLINE, CRANE—Link-Belt Speeder Corp., Chicago. Catalog 1943 cites these features of the 1¼-yd. heavy-duty Model LS-120 crawler shovel, crane, dragline: All-welded unit construction instead of castings; self-aligning center pin bearing; self-aligning rotating rollers and fully independent rapid boom-hoist. The front-end attachment of the LS-120 pull shovel, of completely new design, is said to permit deeper and more positive digging than before.

STEAM HOSE—B. F. Goodrich Co., Akron, Ohio. Catalog section gives simple, easy-to-read rules for the care and maintenance of steam hose, as well as detailed instructions on the proper methods to attach couplings.

VALVES—Fairbanks Co., New York City. Catalog 42 contains descriptions of bronze and iron valves and dart unions. It also shows sectional views of most valves, illustrations of various parts with prices and contains many tables of valuable information.

the CHANCE SAND FLOTATION PROCESS *for cleaning Bituminous Coal*

CRITERION COAL

CONSOLIDATION CLEAN COAL PATHFINDER

POWHATAN

Superwashed ZEIGLER Super-7 STOKER COAL

A Few Trade Names of CHANCE CLEANED COALS

All Famous For Quality and Fuel Satisfaction

Castle Shannon

CONSOLIDATION CLEAN COAL MOUNTAINEER

PURSGLOVE

CONSOLIDATION CLEAN COAL CAVALIER

"COLVER" TRADE MARK BITUMINOUS COAL

FLOAT KLEEN

UNITED ENGINEERS & CONSTRUCTORS INC

NEW YORK PHILADELPHIA CHICAGO

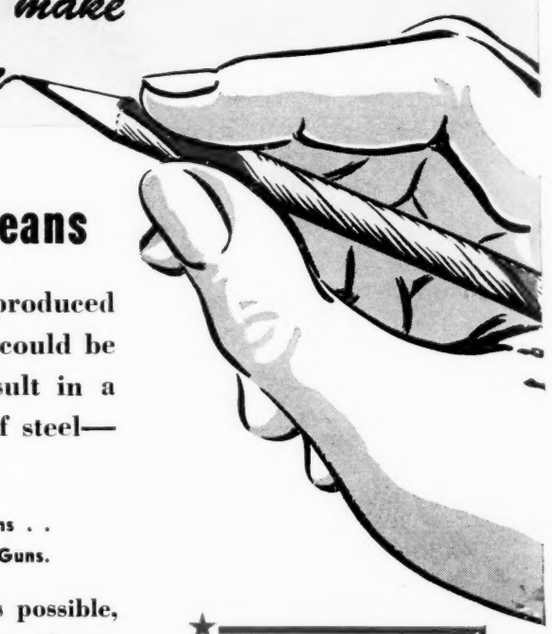
LET'S Do Some Figuring

344,966,000 POUNDS ★

5% LONGER LIFE

17,248,300 STEEL SAVED

+ the Man-hours required to make 17,248,300 lbs. of wire rope



NOW... Let's see what that means

344,966,000 pounds of wire rope were produced in 1941. If (by better use and care) its life could be increased a mere five per cent, it would result in a saving of approximately 17,248,300 pounds of steel—which would be sufficient to make:

1,277,652 3" Shells . . 172,483 50-Calibre Machine Guns . . 8,624 4-ton "Block Busters" . . 1,437 3" Anti-Aircraft Guns.

While ideal working conditions are not always possible, the five per cent saving suggested in our example is a maximum of what might be expected with a little *additional* care. Let us help you get maximum "mileage" out of the wire rope you are now using. A copy of our 44-page illustrated booklet, "Practical Information on the Use and Care of Wire Rope", is yours for the asking, and our experienced Engineering Department is always at your service.

★ This the quantity of wire rope produced in 1941 *only*. If this longer life — a mere five per cent — could be obtained from all wire rope now in use, the steel saving would be much greater.

A. LESCHEN & SONS ROPE CO.

WIRE ROPE MAKERS — ESTABLISHED 1857

5909 KENNERLY AVENUE — ST. LOUIS, MISSOURI, U. S. A.

NEW YORK . . . 90 West Street
CHICAGO . . 810 W. Washington Blvd.
DENVER . . . 1554 Wazee Street

HERCULES RED STRAND WIRE ROPE

SAN FRANCISCO . . 520 Fourth Street
PORTLAND . . 914 N. W. 14th Avenue
SEATTLE . . 3410 First Avenue South

TIMELY OPERATING IDEAS

Coal-Pocket Design Eliminates Need for Major Repairs

A HUMBLE member of a breaker's flow sheet is the coal pocket but if it is out of commission it will interfere with production as greatly as a defect in machines rightly regarded as of far greater importance. If repairs are necessary and the breaker has to run, the pocket that needs repair has a nuisance value that cannot be overlooked. Especially annoying is the necessity for repairing the partition wall between two pockets, as then both pockets are out of service at the same time and the tonnage of the breaker may be decreased until the repair is completed. Usually, as the pockets are all erected at the same time, they all are in need of repair together, and the breaker has a continuous repair performance that, unless it takes a vacation for renewal, will interfere with its efficiency and capacity.

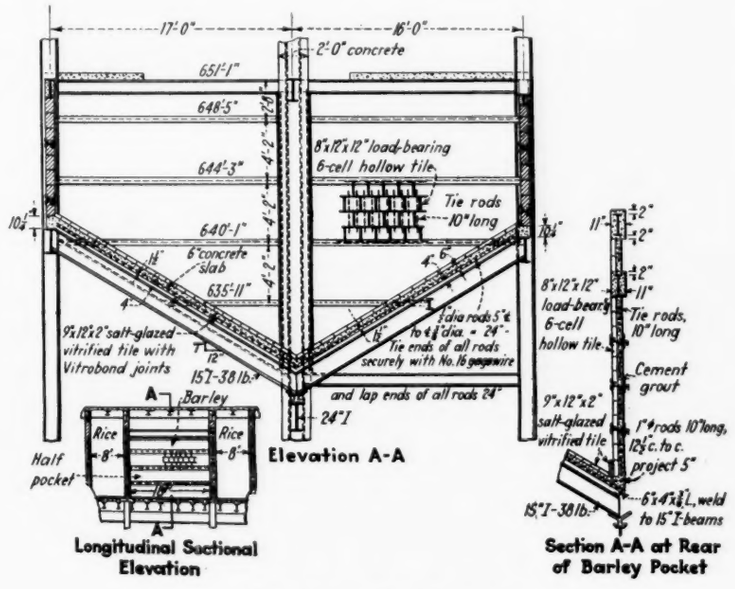
For this reason, the Hudson Coal Co., though it built the pockets of the Loree No. 5 Breaker with a steel framework, uses 8x12x12-in. load-bearing six-cell hollow tile for the side walls of pockets, for the end walls (outer walls of a row of pockets) and for the partition walls between them. The floors are made of 6-in. concrete reinforced with ½-in.-diameter rods on 5-in. centers crossed by ⅜-in.-diameter rods on 24-in. centers, all tied with 16-gage wire. Over this is laid 9x12x2-in. salt-glazed vitrified tile with joints of Tegul-Vitrobond. This material (Atlas Mineral Products Co.) is a sulphur-base cement plasticized with Thiokol ("synthetic rubber")*. It melts at 250 deg. F. and flows in a thin stream at 290 deg. At about this latter temperature it is run in between the tile. This joint is not affected by the presence of acidulous water as is the cement used to attach the side blocks to each other, but the floor, as it is actually covered by the water, needs more protection than the side walls.

The Vitrobond is self-sealing and needs no calking; it resists vibration, mechanical punishment and changes in temperature; it adheres promptly and firmly to metals and to concrete or ceramic surfaces and expands and contracts little; it is unaffected by water. However, the tile should be dry when the bonding material is applied. As, near the bottom of the walls, the water tends to rise at the lowest point in the pockets, a lip of 9x12x2-in. salt-glazed tile is set vertically at that point so that, if the water should rise a few inches in this part of the pocket, it will do no harm to the concrete.

This method, and these materials of construction, were used in the Marvine breaker, the pockets of which have been in service since 1939. To date they have shown "absolutely no disintegration or wear," according to E. M. Snyder, chief mechanical engineer. Hollow tile with ordinary cement mortar, 1:2 mix, were installed in partitions in the same breaker and none of these partitions have involved any maintenance expense. Therefore, they are being used in the Loree breaker, with the exception that at that plant the tile were bonded together with dowel rods 10 in. long and the cells of hollow tile were filled with cement mortar.

The Hudson Coal Co. has used the same Tegul-Vitrobond to bind the liner plates of a 36-in. concrete pipeline, but, for jointing cast-iron water pipe, Tegul-Mineralead, another Thiokolized sulphur cement, has been used.

* An oil-resistant rubber-like material made by the reaction of polysulphides with ethylene dichloride or dichlorethyl compounds.



Details of pocket construction.

Roller-Top Winding Stand Is One of Shop Helps

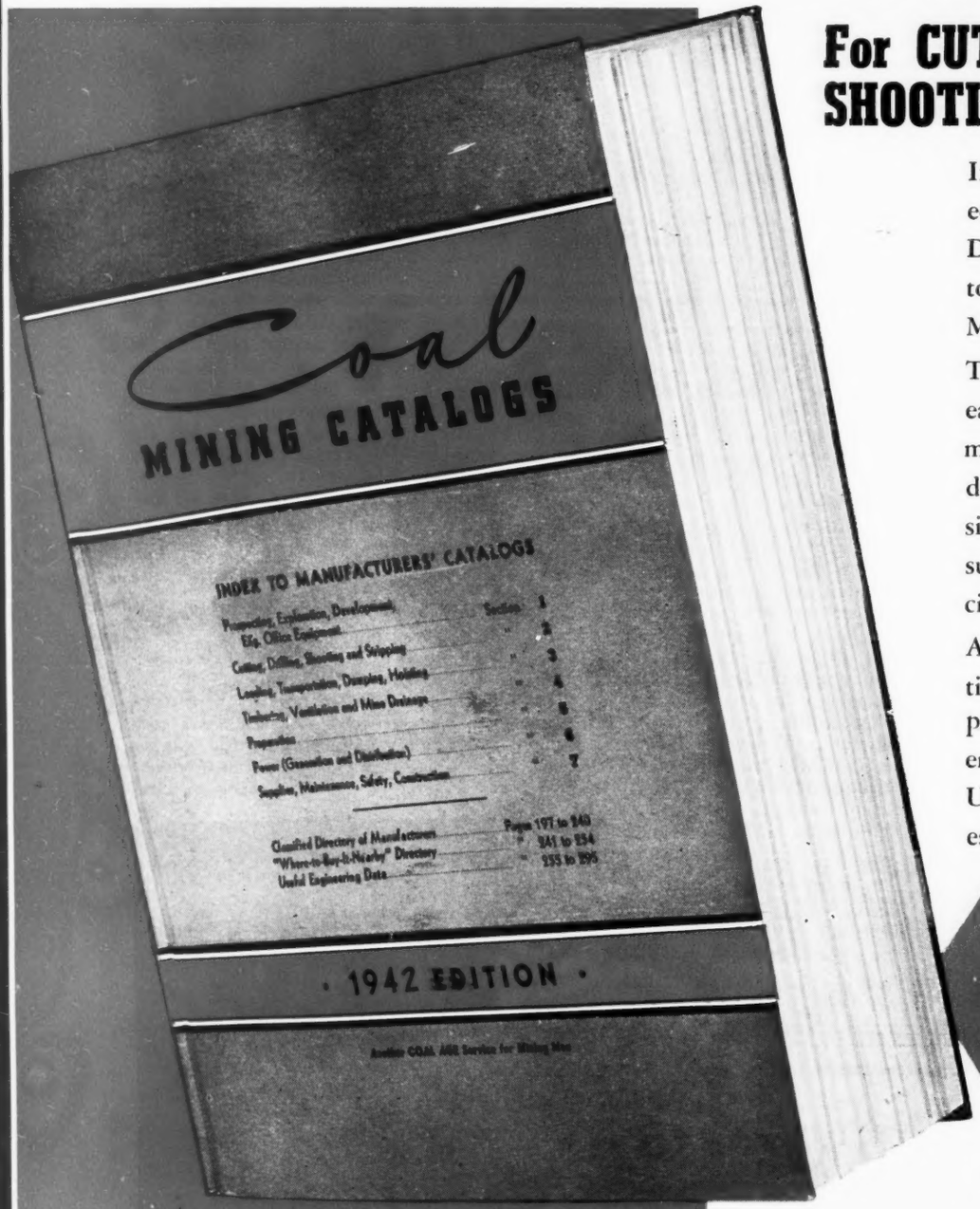
In the maintenance shop an item or machine in a position for convenient access is a long step toward efficiency and good workmanship. With an electrical winding job, where the whole thing can be ruined by one tiny defect in workmanship, every helpful step should be taken. An example from a photograph made at a southern mine is shown in the accompanying illustration.

Stator in convenient position for soldering the coil connections.

The stand has two rollers 3 in. in diameter, 22 in. long and mounted with

YOURS FOR THE ASKING!

• • MANUFACTURERS' CATALOGS of Equipment and Supplies



For CUTTING, DRILLING SHOOTING, & STRIPPING

If you're looking for catalog data on equipment and supplies for Cutting, Drilling, Shooting, or Stripping, turn to page 10 of your 1942 COAL MINING CATALOGS.

There you'll find indexed for quick, easy reference the catalogs of 61 manufacturers — up-to-the-minute data that will help you specify, requisition and buy the equipment and supplies you need for modern, efficient coal production.

And this is only one of the seven sections in this helpful catalog you find packed full of useful data conveniently arranged for speedy reference. Use it daily for the information so essential to maximum production.

A Free COAL AGE *Service to Mining Men*

Today, where every minute saved means increased coal tonnage for essential war effort, you'll find COAL MINING CATALOGS more helpful and useful than ever before in your specifying, requisitioning and buying. In improved sectionalized form, with the latest catalog data from manufacturers, this new 1942 edition is one catalog you'll keep right at your elbow for daily, speedy reference.

Send For Your Copy TODAY !

If you are responsible for the specifying requisitioning, or buying at your mechanized property and you don't have available your free copy of the NEW 1942 EDITION, *request it immediately.* Write us on your letterhead, telling us about your property, or use the coupon. We'll see that you receive your copy by return mail

Free—USE THIS HANDY COUPON

C.A., Dec., '42

COAL MINING CATALOGS, 330 West 42nd St., New York, N. Y.

Gentlemen: I am responsible for specifying, requisitioning, or buying equipment and supplies needed at our property, and do not have access to COAL MINING CATALOGS. Please forward me a copy of the 1942 Edition immediately. (If my country imposes a duty on such Catalog books, I agree to pay same.)

Name ..... *Title* .....

Company Name .....

City Address ..... *State* .....

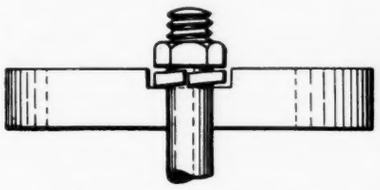
The nature of our operation is .....

their bearings 15 in. apart. With the motor stator placed thereon, it can be rotated with safety and ease through a sufficient number of degrees to allow convenient access to all group or coil connections. In the illustration, the electrician is soldering the connections of a newly rewound stator for a General Electric 35-hp. 2,300-volt 600-r.p.m. motor.

•

Recess Cut for Lock Washer May Prevent Damage

Lock washers sometimes break, and when they do they are likely to work out from under the head of the machine screw or capscrew. A piece of washer falling into gears or other working parts of small clearance will cause serious damage. Moreover, if the whole washer



Recess for lock washer.

comes out, that leaves a lot of play which in some instances hastens breakage of other parts.

Cutting the part to make a recess for the washer, thus preventing its falling out, is a precaution which manufacturers now follow in the design of certain parts of modern machines. In the mine shop the same practice should not be overlooked when making repairs or when modernizing equipment.

•

Moving of Machines Solved By Special Truck

The problem of transporting loading machines and shuttle cars between the working face and outside repair shop of a drift mine has been admirably solved by Luzerne-Graham Mining Corp., Graham, Ky. A truck, built up by arc-welding, is provided with double parallel rails on which loading machines or a crippled locomotive may ride, and with rail clamps to hold the machines in place. Channels outside the rails, with wide sheet-steel wheel pockets, provide the resting place and anchorage for shuttle cars.

This transfer car is built quite low. With the aid of a few heavy planks, machines are quickly loaded or unloaded by their own power. The car is simple, strong and requires little material to build. Time saving is its big advantage; getting the machine to repair facilities and promptly back on the job.

•

Reel for Arc-Welder Cable Minimizes Wear and Tear

In these war days, when it is difficult to replace arc-welding cables, it is highly important to protect them from injury. One way is to keep them off the floor, where sprawling loops may be an

Reel for welding cable, a permanent shop fixture. Wide slip ring at the left maintains power contact through four brushes mounted in a motor brush holder.

easy victim of falling material, of kinks or of hot iron or torch flames.

Mechanics at the Fiatt (Ill.) mine of Truax-Traer Coal Co. devised a reel to carry a cable long enough to reach around the shop where locomotives and trucks are housed and maintained.

Contact with the generator terminals is maintained through the wide slip ring and a set of four carbon brushes mounted in a discarded motor brush holder.

More With Less

Coal needs for 1943 have been estimated at 600,000,000 tons of bituminous and 65,000,000 tons of anthracite. This adds up to a sizable job when it is considered that coal, as well as other industries, will feel an increasing pinch in both men and materials. So, if an idea for cutting cost, improving efficiency or promoting safety ever was worth its weight in gold it is now. Here is the place for such ideas. If you have one, now is the time to send it in. Include a sketch or photo if it will help to make it clearer. Perhaps you won't get its weight in gold but a $5 bill or more will be paid upon publication for each one found acceptable.

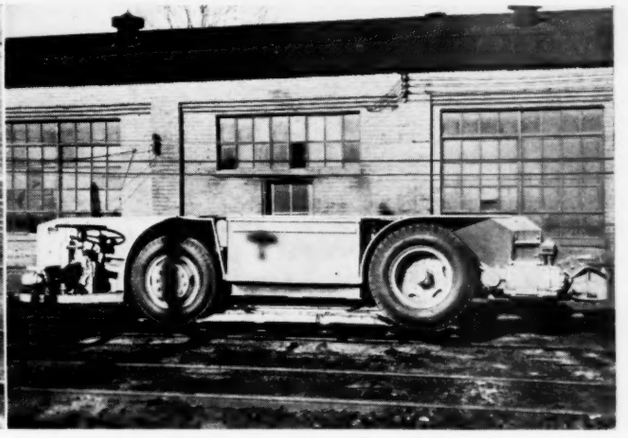
•

Rear-Conveyor Additions Insure Roof Clearance

"Three 14BU Joy loading machines load about three-fourths of the coal in the Cadogan (Pa.) mine of the Allegheny River Mining Co.," writes James Thompson, superintendent, in describing a method of insuring roof clearance over rear conveyors. "Since the seam is the Lower Kittanning, running about 38 in. in thickness, one can see that the machines are working in very limited headroom, especially when we consider that the height of the shuttle cars used is only 34 in. We may add that where the bone coal is burned to the roof and is not loosened by the shots our loading height is further decreased.

"We have experienced much trouble through breakage of the flight chains on the loading-machine conveyors due to the

Transfer truck for loaders and shuttle cars.



Truck with shuttle car ready to move.

shallow channel in the rear conveyor through which the coal must pass when the conveyor is up tight against the roof. The loading-machine operator, of course, holds the conveyor close against the roof in order to load the shuttle car properly.

"To save taking the coal through such a crushing process and provide more room between conveyor chain and roof, we picked from our scrap pile two pieces of channel 2½x18 in. long. Tapering them on the ends, we welded them, one on each side, on top near the end of the rear conveyor on the loading machine. This keeps the rear conveyor 2½ in. lower from the roof at all times and provides the coal with a 2½ in. deeper channel through which to pass to the shuttle car, which has resulted in much less breaking of both coal and chains. I may also add that very heavy flakes of sulphur in our coal was more destructive and difficult to load in our limited height than the coal itself."

•

Kickback Eliminates Ditching Of Runaway Railroad Cars

The usual derail used around mines to prevent runaway railroad cars from going out on the main line operates by throwing the cars off in the ditch. This generally necessitates calling for the big hook, during which it may not be possible to get into the yard, not to mention damage to cars and track. With this in mind, the Northwestern Improvement Co., Roslyn, Wash., developed the kickback shown in the accompanying illustration.

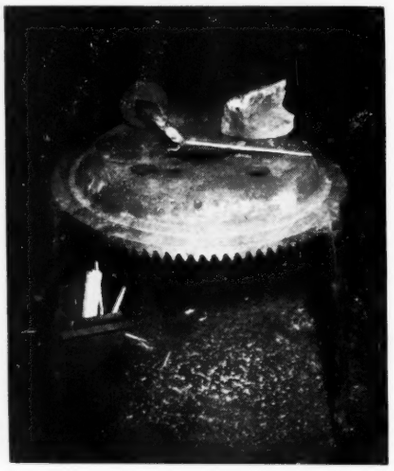
In this installation, the derail is replaced by a standard switch which normally is set against the main line. If a car gets away for any reason, it takes the switch onto the kickback track and runs up the kickback grade until its speed is checked. It then drifts back and may even go back onto the track ahead of the switch, but after oscillating back and forth a few times it stops—still on the rails rather than on the ground. Thus, it is no problem to take care of.

Showing the normal position of the switch to direct runaway cars onto the kickback track in the background, where they are checked as the first step in bringing them to a stop.

•

Dual-Duty Welding Table Made From Scrap Gear

Welding tables preferably have steel tops so that they are fireproof and electrical conducting. Usually they are individual tables of small top dimensions because the heat and light of the arc prevents welders working close together. When a table was wanted at the Leslie (W. Va.) mine of the New River & Pocahontas Consolidated Coal Co. it was made in short order from a scrapped bevel gear out of a 35B Jeffrey shortwall and three pieces of ½x2-in. steel.



Once a gear, now a welding table

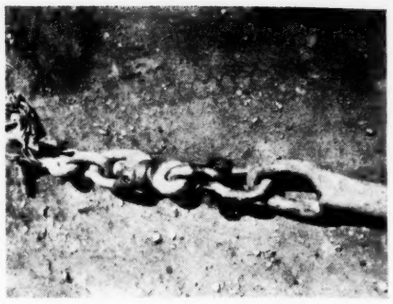
The legs are welded to the outside edge and the job is sufficiently rigid so that no braces are required. The large center hole and the smaller holes in the disk of the gear often are handy in holding irregularly shaped pieces and also for attachment of a drill-press vise for holding parts that require rigid clamping or exact alignment. An electrode box is welded to the inside of one leg. This table also is used for many of the oxyacetylene jobs.

•

Grease Fitting Prevents Trouble With Slope-Hoist Swivels

The problem of keeping swivels on slope-hoisting ropes at the mines of the Northwestern Improvement Co., Roslyn, Wash., from running dry and locking has been solved by the use of a pressure fitting and a relatively heavy grease. If the swivel runs dry the consequent locking may result in considerable twist being stored up in the rope in the course of a trip, which is none too good for the rope and also results in a hazard during uncoupling due to whipping and jerking of the rope as it straightens out after the hitching is freed from the car.

How the pressure fitting is installed in a swivel at Roslyn is shown in the accompanying illustration. It insures that with regular lubrication the grease will flow to the bearing surface and remain there long enough to practically eliminate locking in service. In accordance with good safety practice, swivels and hitchings at Roslyn are regularly inspected and annealed to insure that they always are in good condition.



The pressure fitting insures good lubrication and prevents locking of the swivel.

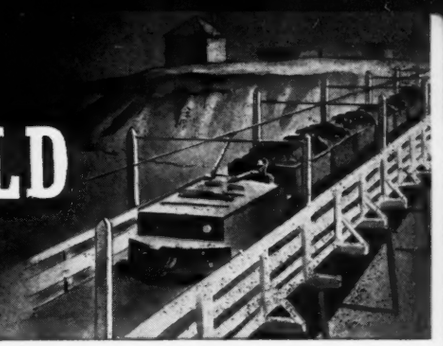
•

Brattice Hung on Messenger Wire For Efficiency and Protection

That part of a brattice line next to the face normally constitutes the greatest problem where it is used, both in keeping it up and protecting it during shooting and movement of equipment. The solution at the Kenilworth (Utah) mine of the Independent Coal & Coke Co. is the use of light stranded messenger wire for the suspension. The wires are made up in the desired lengths, including eyes and turnbuckles, as required. They are stretched between hooks in wooden plugs driven into holes in the roof and the brattice is hung by loops or other convenient means, as shown in the accompanying illustration. Thus, when shooting is to be done or other activities which might involve interference with the brattice are carried on at the face, all that is necessary to do is to push the cloth back on the messenger wire as far as necessary. Conversely, a pull is all that is necessary to bring it back to the face when such operations are completed.

An example of brattice suspension on messenger wire at Kenilworth.

MORE NEWS FROM THE FIELD



High B.T.U. Gas From Coal Sought at Purdue

Indicating that the American gas industry is not falling behind in the search for new and better methods of gas production, a long-range program of research has been in progress at Purdue University, Lafayette, Ind., during the last two years investigating the gasification of coal in hydrogen and the complete hydrogenation of coal to gaseous products at high temperatures and pressures. The work, which is being carried on in the Gas Engineering Laboratories of the University Engineering Experiment Station under the sponsorship of the Indiana Gas Association, is concerned with research on the reactions of bituminous coals with hydrogen, particularly at temperatures above 750 deg. F.

The present aims of the program are to lay the groundwork for a possible method of gas production in which coal will be completely transformed to a gas of high calorific value approximating natural gas in composition and burning characteristics.

Such a process would have great advantages over present methods of production from many standpoints. In years not too far distant when natural-gas supplies dwindle and replacement with some type of manufactured gas becomes necessary, the ease of substitution of a high-calorific-value gas in present natural-gas properties will be an important factor. In addition, the elimination of the need for increased distribution capacity which would be required in the substitution of low B.t.u. gas will greatly facilitate any adjustment, gradual or sudden, which may take place.

From an economic standpoint, the use of coal as a raw material for the production of gas will be advantageous because deposits are so widespread. The use of raw materials which can be obtained close at hand and the resulting decrease in transportation costs will make for low-cost gas. The use of low-cost "waste" coals in large units situated at centrally located mines will require only limited high-pressure distribution systems, in contrast to our present cross-country network.

Although experimental work has not yet progressed to the pilot-plant stage, considerable data have been obtained on the variation in the characteristics of the gasification with such factors as temperature, pressure, time of hydrogenation, and gas to solid ratio. These have revealed much information about the mechanism of the chemical processes involved. In addition, information on yields, gas compositions and coke production under various conditions have been encouraging. It has been possible to produce gases with a heating value of 900 B.t.u. per cubic foot. It also is interesting to note that under some conditions almost complete recovery of the nitrogen in the coal as ammonia has been obtained.

An advantage of the process under consideration over the Fischer-Tropsch catalytic synthesis of hydrocarbons from water gas is that the catalysts commonly employed in the direct hydrogenation of coal are not particularly susceptible to poisoning by the sulphur compounds which abound in most coals. In addition, all indications are that the hydrogen used need not be entirely free from other constituents, such as carbon oxides. In fact, considerable proportions of carbon monoxide in the hydrogenating gas make little difference in the final gaseous products under probable operating conditions.

An important advantage which the method would possess is its adaptability to many different types and grades of coals, irrespective of their composition, coking properties and physical properties. It would seem that almost any type of carbonaceous material is readily amenable to hydrogenation under the extreme conditions being investigated, and thus many coals unsuitable for other purposes could be utilized to good advantage with resultant lowering in gas-production costs.

Keeping Step With Coal Demand

Bituminous Coal Stocks

	Thousands Net Tons Oct. 1 1942	P.C. Change From Sept. 1 1942	P.C. Change From Oct. 1 1941
Electric power utilities	19,872	+9.2	+70.8
Byproduct coke ovens	10,566	+3.2	+44.9
Steel and rolling mills	1,251	+1.3	+51.2
Railroads (Class 1)	13,528	+0.5	+54.5
Other industrials*	32,030	+6.4	+64.0
Total	77,247	+5.5	+60.8

Bituminous Coal Consumption

	Thousands Net Tons Sept. 1942	P.C. Change From Aug. 1942	P.C. Change From Sept. 1941
Electric power utilities	5,686	+0.2	+2.4
Byproduct coke ovens	7,294	−2.8	+7.0
Steel and rolling mills	775	+0.8	−3.3
Railroads (Class 1)	9,459	+0.9	+17.4
Other industrials*	11,841	+4.1	+10.6
Total	35,055	+1.1	+9.8

* Includes beehive ovens, coal-gas retorts and cement mills.

Coal Production

Bituminous

Month of October, 1942, net tons	51,065,000
P.c. change from October, 1941	−0.5
January-October, 1942, net tons	480,125,000
P.c. change from Jan.-Oct., 1941	+16.6

Anthracite

Month of October, 1942, net tons	5,101,000
P.c. change from October, 1941	−8.6
January-October, 1942, net tons	50,555,000
P.c. change from Jan.-Oct., 1941	+5.1

Sales of Domestic Coal Stokers Vs. Oil Burners

	Coal Stokers	Oil Burners
September, 1942	8,684	3,327
P.c. change from Sept., 1941	−67.5	−85.3
January-September, 1942	74,244	47,012
P.c. change from Jan.-Sept., 1941	−49.6	−70.7

Index of Business Activity*

Week ended Nov. 14 (preliminary)	188.2
Percent change from month earlier	+0.3
Percent change from year earlier	+16.8

* *Business Week*, Nov. 21.

Electric Power Output†

Week ended Nov. 14, kw.-hr.	3,775,878,000
Percent change from month earlier	+1.6
Percent change from year earlier	+12.8

† Edison Electric Institute.

Miners Threaten Strike Unless Women Are Fired; They Go

Unless five women slate pickers hired by the Algoma Coal & Coke Co., Algoma, W. Va., were dismissed by Nov. 23, George J. Titler, president, District 29, United Mine Workers, said he would call a shutdown of the mine, which employs about 340 persons. He said he had dispatched a telegram to that effect to William Beury, president of the company, on Nov. 16. Mr. Titler contended that the employment of the women violated the union agreement.

With the remark, "They have ruled against us," Mr. Beury announced on Nov. 19 that he had discharged the women. He declined to comment further.

Heat-Treating With Soft Coal

Findings relating to the use of bituminous coal as a substitute for fuel oil in special forging and heat-treating operations are contained in a booklet—"Saving Fuel Oil for Victory in the Forging Industry"—being released by Bituminous Coal Research, Inc., through operators' associations. Small furnaces such as are used in bolt and nut plants, tools, bits and other types of manufacture, as Bulletin 2090 of the National Coal Association points out, can readily be converted to coal, usually with an increase in capacity and a reduction in operating cost. By addressing B.C.R.I., 803 Southern Building, Washington, D. C., persons further interested may obtain single copies of a paper entitled "Pulverized Coal for Forge Furnaces," read before the June meeting of the American Society of Mechanical Engineers at Cleveland, Ohio.

Absenteeism and Lowering of Accident Rates Themes of Ebensburg Holmes Meeting

Advocate Award of E Banner to Mines—How to Make Delinquents Toe Mark—Absenteeism Not as Rife as Records Show—Injection of Mine Grievances Into Production Discussions Is Condemned

SAFETY and the Victory Coal Production Drive were the subjects at the annual conference of what is now to be designated as the Tenth and Twenty-eighth Bituminous Districts Holmes Safety Association, held at the Court House, Ebensburg, Pa., Oct. 31, with Jerome C. White, engineering department, Weaver mining interests, Revloc, Pa., as chairman. With the seventh column (accidents, with rumors as the sixth) working double-time, said Dennis Keenan, State mine inspector, Barnesboro, Pa., substituting for W. Garfield Thomas, Pennsylvania Deputy Secretary of Mines, Harrisburg, Pa., the State inspectors favor such meetings as helpful to the mine effort.

Committees to Increase Tonnage—Labor-management committees, declared B. W. Deringer, production manager, Central Pennsylvania Coal Producers' Association, were established by Donald M. Nelson, chairman, War Production Board, in accord with a letter from the President. On Sept. 15, Mr. Deringer was given charge of the work for the Central Pennsylvania Coal Producers' Association, Clarence Donaldson holding a like position for the United Mine Workers. Already 148 committees have been established, each with three labor men representing the United Mine Workers and three operators' representatives.

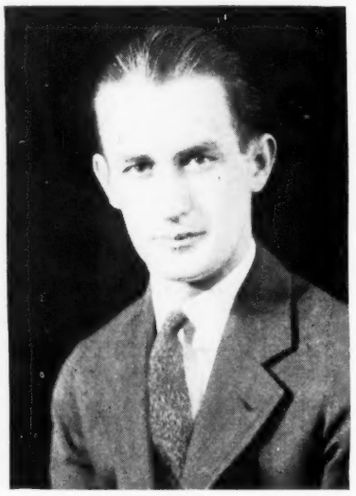
More Coal in 1943

It is estimated that in 1943 600,000,000 tons of bituminous coal will be needed (550,000,000 in the present year), an output far larger than that of 1918, when 579,385,820 tons was produced, and this tonnage must be obtained despite the diminishment of labor supply due to men leaving for the armed forces and other industries.

Original Objectives—As originally suggested, the committees were to: (1) erect a production score board; (2) arrange for a study of plant efficiency; (3) put up suggestion boxes and arrange for handling suggestions; (4) set up bulletin boards and provide for posting special *communiques*, and other material; (5) establish a method of distributing production news, (6) establish a subcommittee on posters to be hung throughout the plant in cooperation with the War Production Board; (7) start a slogan contest; (8) spread the drive to subcontractors and trainees. To these have been added scrap drives, merit certificates and car-sharing arrangements. There are thousands of ways in which help can be extended by these committees.

Less Absenteeism Than Stated—Absenteeism has been a problem, but also the subject of much loose talk, as a man may be absent involuntarily because of roof falls and water, changes of shift and other causes, or the company may not have a place for him to work. The figure for voluntary absenteeism has been set between 7 and 10 percent, but, actually, 6 percent probably is more correct. This, however, is too large. Absenteeism is at its height on Monday and descends until Wednesday and then again rises to the close of the working week.

Pinch hitting for Mr. Donaldson, Harry Younker, U.M.W. district representative, declared that the chairman and secretary of the board should not both represent either labor or management. Control should be divided. Discussing absenteeism, he said that at one mine it was stated that in a single day 80 men were voluntarily or, as he would term it, "intentionally" absent, but inquiry showed that only 51 stayed away without cause.



Jerome White, gavel wielder.

Two men had been laid off so they could work on Saturday and some were idle because there were no working places for them. In some instances, absenteeism was due to laxity of management. In one case, the assistant boss at the face made little effort to find places for idle employees, laying off 28 men, though 22 of them could have been employed in other parts of the mine.

Tonnage Sole Aim of Committees—Maximum production, not union labor problems, should be discussed at production-drive meetings, declared Mr. Younker. It is the government that demands our services and board members are present solely for the purpose for which they are called. Overextension of hours must be prevented, as it will decrease safety and reduce efficiency. England has found 42 to 48 hours weekly better than a longer time.

Merit Certificates—In the opinion of William Lamont, general manager, Sterling Coal Co., Elmora, Pa., the conditions under which merit certificates will be distributed should be more definitely understood and defined. The award, said Mr. Deringer, should be given to any man who makes a suggestion contributing to the war effort by increasing production. Buttons for men who work steadily are desirable. In the anthracite region, a badge like a service stripe is provided for regular workers, and there are four different buttons to evidence regularity four months in sequence.

In reply to Mr. Lamont's further comment that determination of the correct reasons for absenteeism were too much work for the production manager and secretary, he said that it should devolve on other members of the committee. Some men want pay for this work, said Mr. Deringer, but it should be done without compensation as a patriotic duty. Because men live so far from the mines and so are difficult to reach, and also because committeemen spend so much time commuting, added Mr. Lamont, it is difficult to get the true causes of all absenteeism, but when a man gives in his lamp, he is given his absence slip and two committeemen are stationed nearby to receive his true reason.

Where Committees Are Headed—Absenteeism, Mr. Lamont declared, was rife after pay days and output dropped 300 tons on one night shift prior to pay day. What was wanted was instructions explaining how the business of the production committee should be conducted. Mr. Deringer explained that it would have been easy to set up such an exhaustive reporting and posting system that the entire time of six or eight men would have been necessary. That was not desirable, so the board decided to crawl first and walk later. Accordingly, it now asks that last week's work be compared with that of the week preceding; that in reporting absences, the absent men's occupation be stated and the reasons for absence, also the day's tonnage.

"E" Flags for Mines

He suggested that the mines should be divided into classes: (1) above 4,000 tons production daily, (2) between 2,000 and 4,000 tons and (3) between 50 and 2,000 tons. Flags with the letter E (excellence in production of war materials) might be floated at the mine that had the best record in its class.

Other Problems—Replying to a question whether men on the mine grievance committee should be permitted to be on the production committee, Mr. Younker said it was desirable, for they understand the problems better, have the confidence of the mine workers and are fair. The only objection is the added work they will have to shoulder, but—and this is important—the work of the two committees must be kept apart. In reply to D. C. Boag, superintendent, Diamond Smokeless Coal Co., Boltz, Pa., Mr. Deringer said that a man with a lengthy disability should be removed from the rolls if the condition is assured.

One man asserted that if a man could not be brought to time by argument of his fellows, an appeal should be made to

the defense committee, a neutral body that might be able to change his mind. In fact, the committees might meet with the defense councils, declared Mr. Deringer, or an open meeting might be held. The board desires to leave the methods flexible, unhampered by any definite rules.

Safety by Suasion—"In dealing with men that object to rules," said James McCarty, safety inspector, Koppers Coal Division, Sonman, Pa., "I ask, 'If you have an accident, who goes to the hospital—the stockholders or yourself? Who gets it in the neck?' " Compliance is contagious. If one man complies, others usually will do the same. Too many rules are in the book now and are not remembered. He who governs least, governs best, and little is gained by another rule added to the book.

One may sell an idea to the employee or "give it" to him, but a rule given in that manner won't stay down. It may be impossible to continue to insist on such a rule when there is a shortage of labor or some other difficulty. Enforcement is necessary, but, like the surgeon's knife, it should be used only as a last resort.

The reasoning man, who thinks before he acts, asserted N. M. Aycock, Texas Co., New York, usually does not need to receive safety advice, but the emotional man has to be sold. However, anyone will do what he is asked to do if you know how to ask him to do it. In place of command, show him the benefit that safety will afford him, and he will do what is wanted. Tie up the recommendation with his hobby. If he is a ball player, tell him that if he smashes his finger, he won't play in Saturday's ball game. Most people will succumb to the argument that dollars of pay are more than dollars of compensation.

•

West Pennsylvania Miners Buy $1,404,706 in War Bonds

Investment in War Bonds and Stamps by 22,769 coal miners in western Pennsylvania since the attack on Pearl Harbor total $1,404,706, according to Byron H. Canon, treasurer of the Western Pennsylvania Coal Operators' Association. At eight of the 43 member companies, 100 percent of the employees have subscribed while workers at 16 companies have earned the right to fly Minute Man flags with subscriptions of 90 percent or greater. An average of 85 percent of the employees of all member companies of the association have subscribed.

•

New Colliery for Crows Nest

Opening of a new colliery, the Elk River, 3½ miles from Fernie, B. C., is to be undertaken by the Crows Nest Pass Coal Co., Fernie, at a cost of $1,258,000, according to William Whittaker, engineer in charge of the project. The mine, the tenth in the area to be opened by the company since it began operations, in 1888, is situated on the south side of the valley.

A new concrete steel-framed preparation plant will be installed at a cost of

Gentleman of the old school

● The characteristics of coal have not changed over the years but drilling methods today are greatly improved over those in use when Martin Hardsocg first began the manufacture of mining tools in 1879. He introduced the principle of rotary drilling which is the basis of all present day coal drilling practice.

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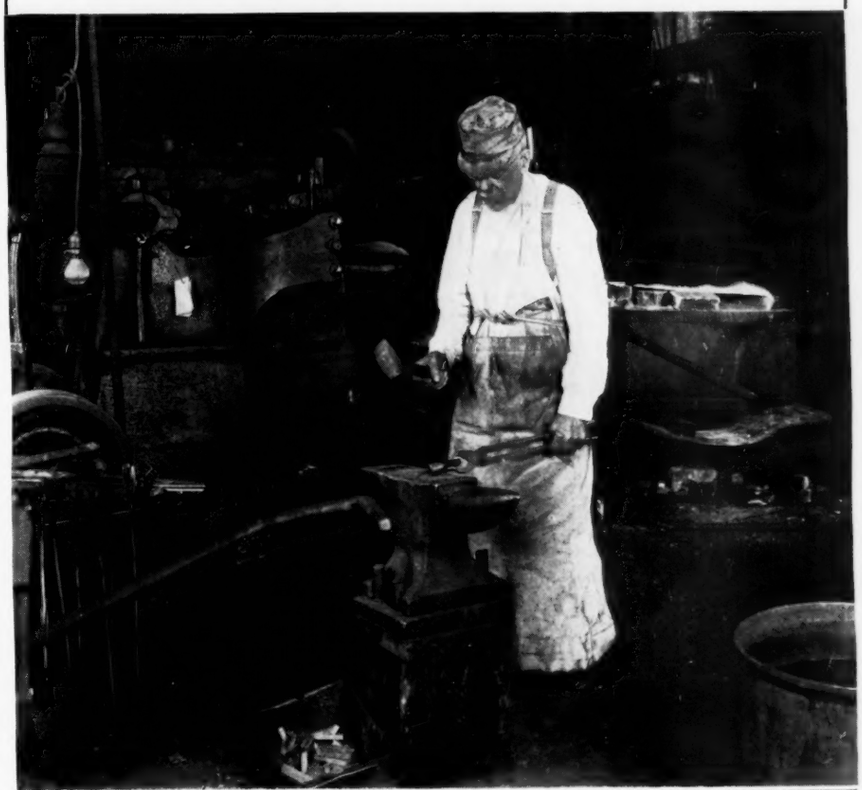

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$350,000, and a machine shop, office, warehouse and lamphouse at a cost of $115,000. Output of 4,000 tons per 16-hour day is planned and 4,000 hp. of electricity will be used in the operations.

•

46c. Cut in Anthracite Rates Recommended by Examiner

A reduction of 46c. per gross ton in anthracite freight rates to New York tidewater piers has been recommended to the Interstate Commerce Commission by Examiner F. L. Sharp in Docket 27766. In this action, brought in the name of the Alden Coal Co., the examiner concluded that the rate should not yield more than 10 mills per net ton-mile, which would make the rate $2 per gross ton, a reduction of 46c. To take care of a long-established relationship between sizes and groups of piers, however, the following rates were proposed: upper New York piers, $2.10 per gross ton for prepared sizes, $1.98 for pea and smaller; lower piers, $2.05 for prepared sizes, $1.93 for pea and smaller.

Permission to intervene in the case of Northern Colorado Coals, Inc., against the Santa Fe and other railroads (Docket 28887) alleging that rates to points in Colorado, Wyoming, South Dakota and part of Kansas were unduly perferential to producers in other fields was granted the Illinois Coal Traffic Bureau Nov. 18.

•

Proposed Changes Stiffen Law On West Virginia Mining

Proposed changes in the mining laws of West Virginia, made public Nov. 14, would put safety regulations into statutory form by giving the State Department of Mines definite powers of enforcement. According to Senate President Byron B. Randolph, chairman, interim legislative committee, the proposed bill was to be discussed at a public hearing in the State Senate chamber at Charleston Dec. 1 and submitted to the 1943 Legislature for action in January.

Senator Randolph said the bill, the outcome of a study of the mining laws begun by the committee in 1941, "is the only inspection report codified in statutory form . . . to enact the existing departmental practice and clarify the extent of the department's authority." Designed to be impartial and uniform in their enforcement, provisions of the measure, the committee reported, were drawn so that careful operators will not suffer because of unfair practices of marginal competitors who cut corners in mine safety procedure.

Provisions recommended by the committee are:

1. Certification of mine officials through an examination to determine their capability of preserving mine safety and thus broadening the "narrow responsibility of the traditional fireboss."

2. Inspection of mines by such certified officials every 3½ hours instead of the present fireboss run before the men start work.

3. Establishment of "danger stations"

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WALTER TRACTOR TRUCKS are not just another highway hauling truck. They are designed, powered and built for heavy, punishing off-the-road work such as coal hauling, iron ore hauling, construction jobs, etc., where extraordinary power and traction are required to haul enormous loads on soft, uneven or slippery surfaces and up steep grades.

Walter Tractor Trucks are helping many leading strip coal mines meet war emergency tonnage demands. They are hauling 25 to 40 tons per trip in single trailers, 50 tons in double trailers—carrying on under severest weather and running conditions or extra-shift operation.

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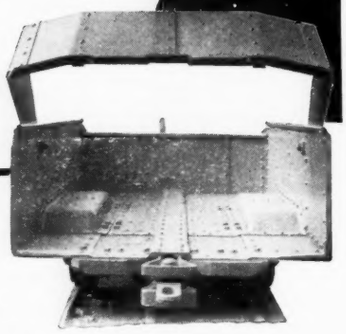

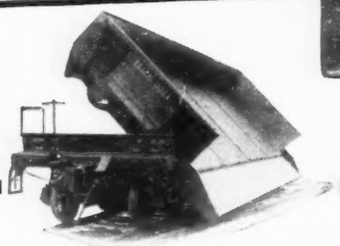

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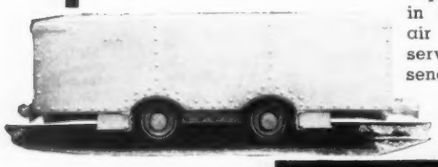
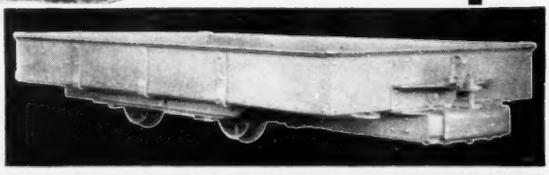


PRESSED STEEL CAR



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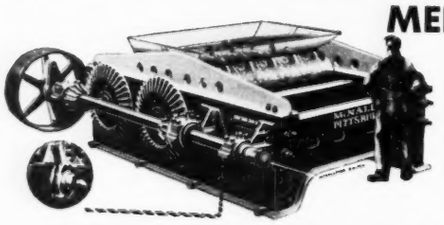

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Bureau of Mines Approvals

Two approvals of permissible equipment were issued by the U. S. Bureau of Mines in October, as follows:

Clarkson Mfg. Co.—Type 24BB loading machine; 50-hp. motor, 210 volts, d.c.; Approval 459; Oct. 30.

Goodman Mfg. Co.—Type 97-C-26 belt conveyor; 15-hp. motor, 230 volts, d.c.; Approval 460; Oct. 30.

in mines for all hazards instead of having fireboss stations only at gaseous mines.

4. Increased timbering of mines on a systematic basis.

5. Additional safeguards to assure proper ventilation.

6. Installation of permissible drills, cutting machines, loaders and other equipment in gaseous mines as the non-permissible machinery wears out. The committee explained that the reform must be gradual considering the extensive investments in non-permissible machinery, but it recommended that in any event only permissible machinery should be in use ten years hence.

Considering the present shortage of machinery and materials, the committee would provide legal safeguards for the Mines Department chief to grant the industry adequate relief whenever "impossible or inexpedient for the law to be enforced."

Among changes involving strip mining is one which would double the $150 per acre bond minimum for replacing earth. Any operator in default would be required to post $500 per acre for a new permit.

•

Romance of Wire Rope Related To Mining Electrical Group

"The Navy," declared Walter Voigtlander, chief engineer, Union Wire Rope Corp., Kansas City, Mo., "puts wire rope in the same class with rubber as a strategic material." The romance of wire rope was revealed to the Mining Electrical Group of Southern Illinois at its November meeting at West Frankfort, Ill., through a two-reel talking movie, the first reel covering the fabrication from mill rods to the shipping room, the second illustrating abuses that shorten the life of wire ropes.

Mr. Voigtlander has calculated that only 0.1 percent of the effort going into the manufacture of wire rope is manual. This almost total mechanized manufacture results in a product of extreme uniformity and mechanical accuracy.

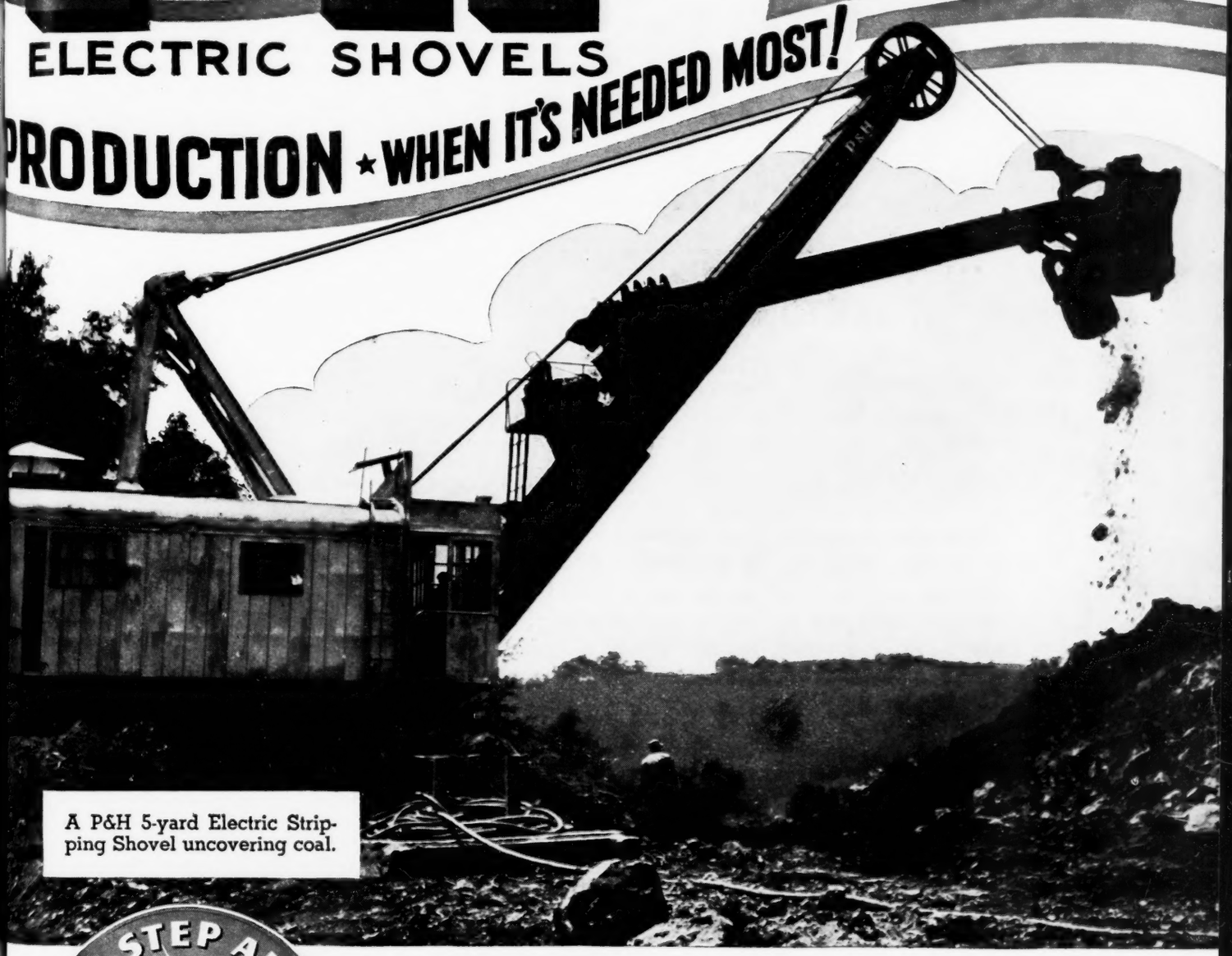
Selection of the correct rope for any application is a problem for the rope salesman or engineer. The judgment required comes from the opportunity to observe rope behavior in a wide range of applications. For mining-machine service, a 6x37 rope has been found to give the best service. On small drums a wire center is better than hemp.

When socketing ropes a 100 percent job can be made by using pure zinc. Under heavy stress, softer metals will flow,

P&H

ELECTRIC SHOVELS

PRODUCTION ★ WHEN IT'S NEEDED MOST!



A P&H 5-yard Electric Stripping Shovel uncovering coal.

BE A STEP AHEAD WITH P&H

MORE FOR YOUR EXCAVATOR DOLLAR

Awarded the Navy "E" for excellence in war production, P&H displays it also as a pledge of future effort.

—**MORE POWER** per yard of dipper than you'll find on any other excavators.

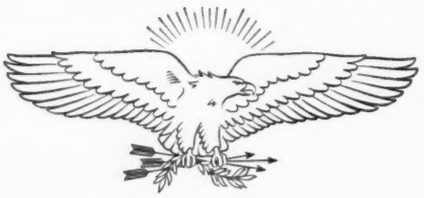
—**RUGGED STRENGTH** to keep up steady production is built into these P&H's with tough rolled alloy steels.

—**RIGIDITY** to withstand torsional strains is assured with both upper and lower structures *welded as single units* to prevent weaving.

These, and many other P&H advantages, result in steadier, faster production on America's vital war-time jobs.

HARNISCHFEGER
CORPORATION
EXCAVATORS • ELECTRIC CRANES • ARC WELDERS P&H HOISTS • WELDING ELECTRODES • MOTORS

General Offices: 4540 West National Avenue, Milwaukee, Wisconsin



An Urgent War Need

GREATER PRODUCTION OF COAL

...and how the proper use of VENTUBE* can help!

THE COAL INDUSTRY has been called upon to do a job for Uncle Sam. "More and more coal, faster and faster!" is the cry — and every man-hour counts.

We'd like to offer a suggestion that may help —that you re-examine your working procedure at the face to see if a Du Pont VENTUBE System can't be used to clear the air more quickly, so that less time will be lost immediately after firing. At the same time, this will help to safeguard the lives of men in strict accordance with local and national safety regulations.

Recently a new VENTUBE HANDBOOK was published. In it are many suggestions which may enable you to use your VENTUBE System more efficiently, and to help your men take better care of the duct so that it will give longer service. Please write for your copy today. E. I. du Pont de Nemours & Co. (Inc.), "Fabrikoid" Division, Fairfield, Connecticut.

**"Ventube" is Du Pont's registered trade mark for its rubber impregnated flexible ventilating duct*

DU PONT
REG. U.S. PAT. OFF.
VENTUBE
REG. U.S. PAT. OFF.

Better Things for Better Living ... *Through Chemistry*

permitting the rope to pull out or otherwise fail.

Lubrication so that the lubricant penetrates the strands rather than being plastered over the surface is the most important item in the care of ropes. The proper application, the number of seizings; the avoidance of kinks, small sheaves and drums, narrow or imprinted sheave grooves and mechanical injuries, like cuts, short bends and crushing, all play an important part in the life of ropes.

The lubricating experience of one coal company showed that the simple process of removing ropes from place and giving them a hot steam shower bath followed by a tub bath in hot oil prolonged their life 300 or 400 percent. The steam jets melted and washed out all the oxidized stiff grease, the thin hot oil penetrated the strands and put the oil "inside," where needed.

War conditions have speeded the effort to find a satisfactory substitute for hemp for the core. Some substitute will have to be used as the hemp supply is dwindling.

Mr. Voigtlander closed the program by urging that the utmost be done to conserve the ropes we have, for new ones are not easy to get.

•

New Bill Seen as Lewis Move For Voice in Coal Control

The initial move by John L. Lewis, president, United Mine Workers, to regain a voice in regulation of the bituminous coal industry under federal legislation is embodied in a bill introduced Nov. 16 in both the Senate and House of Representatives in Washington. The measure, drafted by the legal department of the U.M.W., was presented in the Senate by Senator Guffey (D., Pennsylvania) and in the House by Representative Jenkins (R., Ohio). The new bill is meant to replace the present Bituminous Coal Act of 1937, which expires April 26, 1943.

The latest measure proposes to transfer the functions and powers of the Bituminous Coal Division, Interior Department, to a three-man commission—one a representative of the public, one of the operators, and the third of the United Mine Workers. The original Guffey-Snyder bill, enacted in 1935 and declared unconstitutional by the Supreme Court because of its labor provisions, was administered by a commission of five. As revised—bereft of labor provisions—and reenacted in 1937, a seven-man body was set up. But in 1937, as a result of dissension over its administration, President Roosevelt abolished the commission and gave the Interior Department jurisdiction.

Meanwhile, conferences of operators, labor leaders and others interested in extension of government regulation have been going on, and it is understood that the Interior Department will offer another bill, presumably to retain full authority for Secretary Ickes and the Bituminous Coal Division. Senator Guffey said action on new legislation would have to be taken first in the House, because of the revenue-raising features of the bill.

FREE WAR POSTERS

Since the present series of war poster illustrations started to appear in Wickwire Spencer advertising, requests for them have been pouring in from every part of the country. Because of this wide-spread enthusiasm, the popular poster shown above has now been reprinted with the title which won first prize in a 4-state contest among war-workers. It symbolizes to workmen America's war-*production* spirit.

The painting is by the famous artist, Boris Artzybasheff, whose illustrations appear in Life Magazine, and on Time Magazine covers. The posters are of a convenient size; will fit wherever there is a 30-inch space.

Another Achievement for

WICKWIRE ROPE!

First manufacturer in all New England to be awarded the Maritime M and Victory Fleet Flag for outstanding production accomplishments.

MAIL THIS COUPON

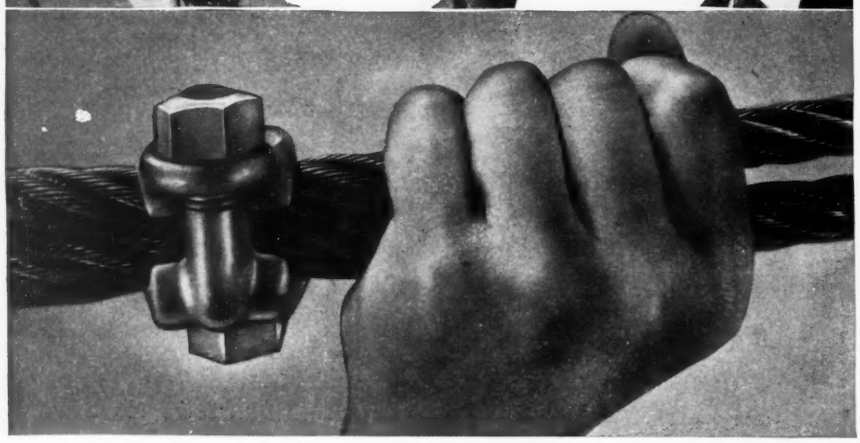
Wickwire Spencer Steel Company,
500 Fifth Avenue, New York, N. Y.

Send.....free posters, "I Pull with Uncle Sam!"

Name.....

Company .....

Address.....



THE SAFETY CLIP **FIST-GRIPS** WIRE ROPE

The finger-pinch of the U-Bolt on wire rope bites and crushes the strands — breakage is possible when the bowed rope takes tension and whipping.

Use the *Fist-Grip* Safety Clip, that holds rope straight and round. Its four flat bearing surfaces act like a *fist* of drop-forged steel.

Inexperienced or rushed workers can't put it on backward — both halves are identical — no possibility of dangerous mistake.

95% rope efficiency is delivered by test — far greater than the U-Bolt Clip.

Safety Clips Give Steel for Victory Program

25% less steel goes into the set of Safety Clips that will out-hold a U-Bolt assembly. And that steel goes straight into guns and tanks and ships when you buy Safety Clips.

More than this, beside needing fewer clips, there is no waste of precious rope from cutting off U-Bolt-crushed ends.

Distributed Exclusively Through Mill Supply Houses

SPEED AND SAFETY WITH SAFETY CLIPS

No rope bowing or crimping
ROPE SAVED

No battered, bent threads
CLIPS SAVED

No special wrench
TOOLS SAVED

Bolts on opposite sides
TIGHTENING TIME SAVED

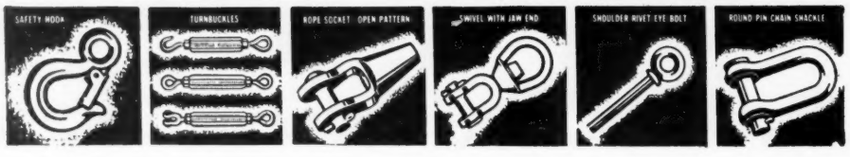
Can't go on wrong
ACCIDENTS SAVED

Fewer clips needed
CLIPS SAVED

Fewer rope breaks
ACCIDENTS SAVED

Look for Laughlin Products in Coal Mining Catalogs

THE THOMAS LAUGHLIN COMPANY
PORTLAND, MAINE



James Predicts Early End Of Bootleg Mining

Bootleg anthracite mines in Pennsylvania have declined in number from 3,006 to 1,198 in the last two years, according to a letter to Governor James from Ed Delaney, Justice Department representative on the Pennsylvania Anthracite Committee, a group organized to stabilize the hard-coal industry. Under the committee's program, legitimate operators have been absorbing the output of independent producers.

Following receipt of the letter Governor James predicted that the problem "will be pretty well cleaned up before I go out of office."

•

Personal Notes

ZACH H. ADAMS, mine foreman for the Consolidation Coal Co., Jenkins, Ky., has resigned to accept a similar post with the Christopher Coal Co., Morgantown, W. Va.

ROY AULT, formerly pit boss at the Bobolink No. 7 mine of the Pyramid Coal Corp., Seelyville, Ind., has been promoted to general superintendent, vice John Hamm, transferred.

W. T. BYRD has been promoted to general foreman of mines for the Hardy-Burlingham Mining Co., Hardburly, Ky., vice C. T. PEARL, resigned.

WORLEY COLLIER, mine foreman for the Consolidation Coal Co., Jenkins, Ky., left Oct. 15 to become superintendent of mines for the Elkhorn Coal Co., Kona, Ky. He was connected with the Elkhorn company several years ago.

A. E. CORDER, mine foreman for the Consolidation Coal Co., Jenkins, Ky., has resigned to join the West Virginia Coal & Coke Corp., Omar, W. Va.

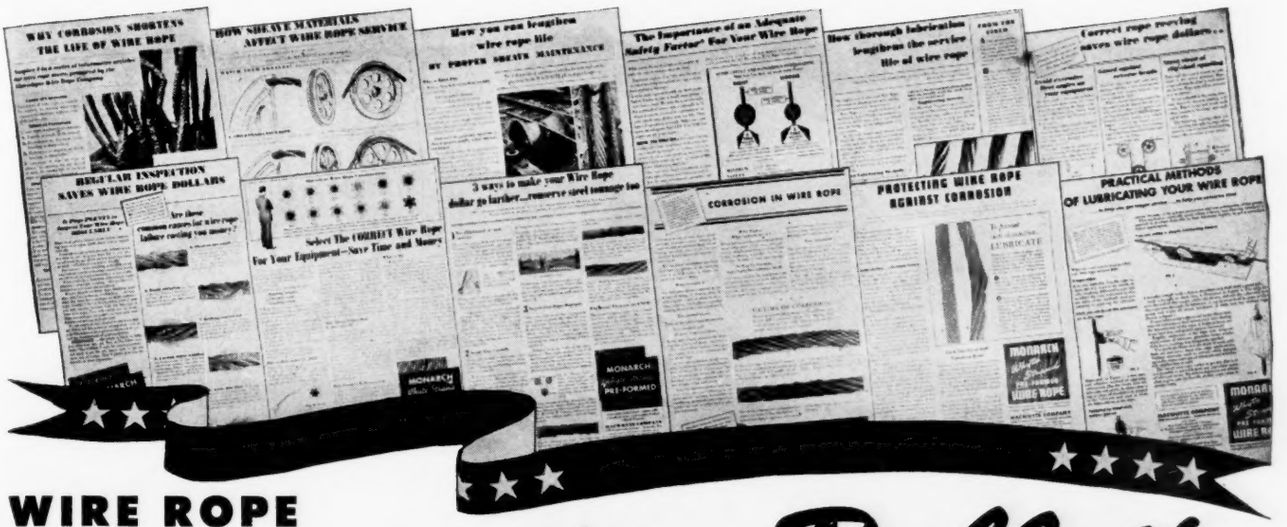
E. A. CORDER has been promoted to superintendent of mines of the Inland Steel Co., Wheelwright, Ky.

SAM CORTIS has left the Pittsburgh Coal Co. to accept an appointment as State mine inspector with headquarters at Ebensburg, Pa. He was honored with a farewell dinner on Oct. 23 by his old co-workers.

THOMAS G. FEAR has been appointed safety director for the Hanna Coal Co. with headquarters at St. Clairsville, Ohio.

PERCY GALEENER has been named mining engineer by the Dering Coal Co. at its Rex No. 2 mine, Eldorado, Ill. He was formerly mine foreman with the Wasson Coal Co., Harrisburg, Ill.

DR. I. V. GRISSOM, Decatur, Ill., has been elected president and treasurer of the Macon County Coal Co., also of Decatur. A contract has been signed with the United Mine Workers and cleaning up is under way preparatory to commencing operations.


WHY CORROSION SHORTENS THE LIFE OF WIRE ROPE
HOW SHEAVE MATERIALS AFFECT WIRE ROPE SERVICE
How you can lengthen wire rope life BY PROPER SHEAVE MAINTENANCE
The Importance of an Adequate Safety Factor For Your Wire Rope
How thorough lubrication lengthens the service life of wire rope
Correct rope reeving saves wire rope dollars...
REGULAR INSPECTION SAVES WIRE ROPE DOLLARS
Select The CORRECT Wire Rope For Your Equipment—Save Time and Money
3 ways to make your Wire Rope dollar go farther...conserve steel tonnage too
CORROSION IN WIRE ROPE
PROTECTING WIRE ROPE AGAINST CORROSION
PRACTICAL METHODS OF LUBRICATING YOUR WIRE ROPE

WIRE ROPE *Conservation Bulletins* SENT ON REQUEST

We pause in this series of informative articles for wire rope users to review briefly the 12 thus far published . . . and provide an opportunity for those who may not have seen them to obtain reprints.

The purpose of this series of single-page illustrated articles on wire rope conservation is to help you conserve your wire ropes. This helps you, and helps our country for it means conservation of steel. We shall be glad to send you any or all of the articles listed below which readers tell us are useful and helpful.

1 ***Why Corrosion Shortens the Life of Wire Rope.*** Tells cause, effect, and suggests remedy for corrosion. Also explains how proper lubrication helps wire rope stand up against elements.

2 ***How Sheave Materials Affect Wire Rope Service.*** Pictures effect of hard and soft sheaves on wire rope. Explains what to watch for, how to avoid rope and sheave damage.

3 ***How You Can Lengthen Wire Rope Life by Proper Sheave Maintenance.*** Includes handy reference table on groove tolerances. Also points out 3 ways to save wire rope dollars.

4 ***The Importance of an Adequate Safety Factor.*** What is it? How Found? When is wire rope overloaded? What are minimum safety factors for various loads? All are answered in this easy-to-read, informative article.

5 ***How Thorough Lubrication Lengthens Service Life of Wire Rope.*** Explains two lubricating methods. Shows effect (Pictures) of ropes left unprotected.

6 ***Correct Rope Reeving Saves Wire Rope Dollars.*** Discusses fleet angles, reverse bends, rope spooling and what to do about them.

7 ***Regular Inspection Saves Wire Rope Dollars.*** Lists 6 common causes of wire rope failure. All can be avoided if rope user follows simple inspection procedure suggested.

8 ***Select the Correct Wire Rope for Your Equipment—Save Time and Money.*** Explains how Flexibility, Abrasion Resistance, and Strength are determined to meet varying conditions of Bending Fatigue, Abrasive Wear, and Loading Stress.

9 ***3 Ways to Make Your Wire Rope Dollar Go Farther—Conserve Steel Tonnage Too.*** Especially valuable to men actually handling wire rope.

10 ***Corrosion in Wire Rope.*** Gives further information on how to combat this rope destroyer. Supplements informative article number 1.

11 ***Protecting Wire Rope Against Corrosion.*** Shows some results of forgetting to inspect and protect wire rope with proper lubrication.

12 ***Practical Methods of Lubricating Your Wire Rope.*** Illustrates simple ways to lubricate your wire rope on the job. Very practical, useful for everyone concerned with wire rope care.

MACWHYTE COMPANY Manufactures:

- MACWHYTE PREformed and Internally Lubricated Wire Rope
- MONARCH WHYTE STRAND Wire Rope
- MACWHYTE Special Traction Elevator Cable
- MACWHYTE Braided Wire Rope Slings
- MACWHYTE Aircraft Cables and Tie Rods

MACWHYTE COMPANY, 2940 Fourteenth Ave., Kenosha, Wis. • *Mill Depots:* New York • Pittsburgh Chicago • Ft. Worth • Portland • Seattle • San Francisco • *Distributors throughout the U. S. A.*

NO. 646

How to get them

Just circle those you wish and attach coupon to, or write on, your business letterhead.

Macwhyte Company
2940 Fourteenth Ave.
Kenosha, Wisconsin

1 2 3 4 5 6
7 8 9 10 11 12

I would like reprints of informative articles on wire rope conservation which you have published recently. I have circled those I wish.

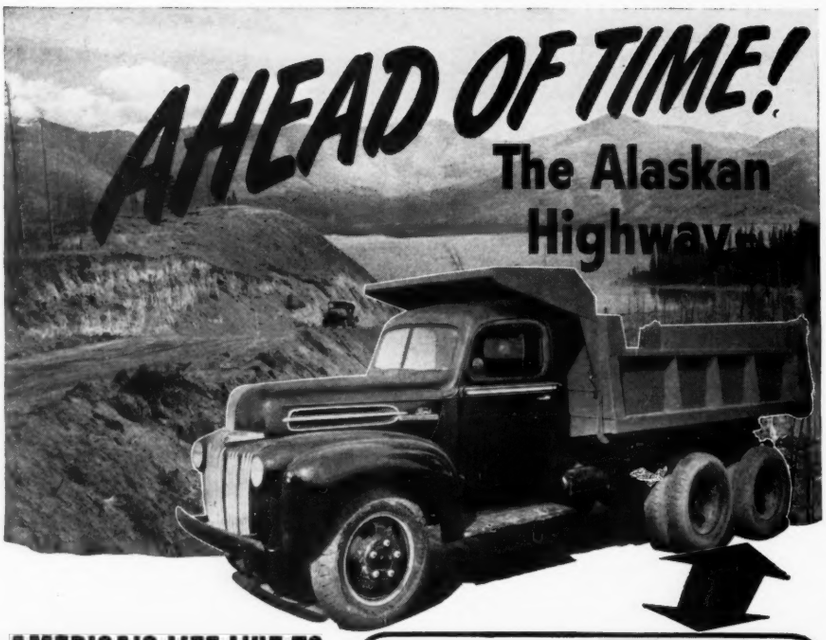
Name _____

Title _____

Company _____

Co. Address _____

City _____ *State* _____

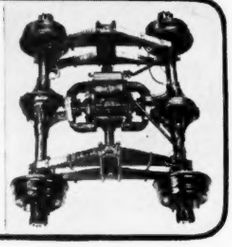


AMERICA'S LIFE LINE TO THE NORTH IS OPEN!—

Operating months ahead of even the stiff schedule set up by Army engineers!

A tough assignment in rough country calling for husky, durable, efficient equipment — and right on the job is a big fleet of trucks with

Put TWO driving axles under the load instead of one, double the gear speeds, improve springing and load flotation, gain vastly superior tractive ability.



THORNTON FOUR - REAR - WHEEL DRIVE

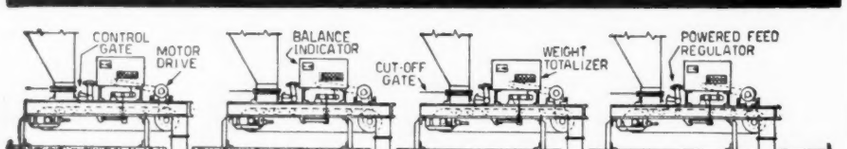
By means of **THORNTON** installations these trucks have been converted from 1½ to 2-ton vehicles into heavy-duty, four-rear-wheel drive trucks handling 6-yard dump bodies.

Standard heavy-duty trucks are not available today—but here is the answer to that problem. You can convert new or used 1½ to 3-ton trucks to husky, reliable heavy-duty units of more than twice the capacity. They actually do the job better and cost less.

While Uncle Sam still approves, act quickly! Contact your nearest Truckstell-**THORNTON** dealer or wire the factory direct. Trained men will engineer this equipment to suit **YOUR OWN PARTICULAR JOB.**

THORNTON TANDEM CO.
8723-8779 GRINNELL AVE. DETROIT, MICH.
Manufacturers also of the THORNTON automatic-locking DIFFERENTIAL
"When you need TRACTION you need THORNTON"

FEEDOWEIGHT



For accurately weighing coal to a mixing conveyor—Controls the rate of feed and continuously totalizes the weight delivered

MERRICK SCALE M'FG. CO., Passaic, New Jersey

JOHN HAMM, formerly general superintendent at Bobolink No. 7 mine of the Pyramid Coal Corp., Seelyville, Ind., has been transferred to Macon, Mo., as general superintendent of the Binkley Mining Co. of Missouri.

WARREN F. HAYDEN has been named superintendent by the Hardy-Burlingham Mining Co., Hardburly, Ky.

H. F. HEBLEY, product control manager, Pittsburgh Coal Co., has been granted a three months' leave of absence to accept an assignment with the Board of Economic Welfare. His duties will require his services overseas.

W. E. HESS, mine foreman with the Elk Horn Coal Corp., Wayland, Ky., for the last several years, has been hired to act in a similar capacity by the Princess Elkhorn Coal Co., Prestonburg, Ky.

ROY ISON, employed for many years as engineer for the Consolidation Coal Co., Jenkins, Ky., has resigned and accepted a similar post with the Red Jacket Coal Corp., Red Jacket, W. Va.

W. J. MANDT, Blackey, Ky., has been made general manager of the Jennie Rue Coal Co., near Blackey, on the Rockhouse Branch of the Norfolk & Western Ry.

ELMER S. MAYOR, general superintendent of the Binkley Mining Co. of Missouri, has been transferred to the Pyramid mine of the Pyramid Coal Corp., Pinckneyville, Ill., to become assistant general superintendent.

HARVEY W. MEADOR has been named vice president of the Stonega Coke & Coal Co., Big Stone Corp., Va., effective Nov. 1.

PAUL MORAN, formerly preparation engineer at the Pyramid mine of the Pyramid Coal Corp., Pinckneyville, Ill., has been transferred to the Bobolink No. 7 mine, Seelyville, Ind., to fill a like position. He will look after the coal company's interest in the erection of a new McNally-Pittsburg washery. The latter plant will be practically a duplicate of the washery of the Fairview Collieries, Inc., Fairview, Ill.

P. J. OLEN, mine superintendent, Carrs Fork Coal Co., Vicco, Ky., resigned Oct. 30 to accept a similar post with the Meems-Haskins Coal Co., Vicco.

F. C. PETTUS, mine foreman at No. 207 mine, Consolidation Coal Co., Jenkins, Ky., resigned Nov. 1 to accept a similar position with the West Virginia Coal & Coke Corp., Omar, W. Va.

C. PLUMMER PRIDE, heretofore safety director for the Christopher Mining Corp., Morgantown, W. Va., has been appointed district mine inspector by the West Virginia Department of Mines.

JERRY H. SANDERS, mine foreman for the Consolidation Coal Co., Jenkins, Ky., has resigned to accept similar work with the West Virginia Coal & Coke Corp., Omar, W. Va.

The Axis started this war of machines... but Uncle Sam's Army is coming up fast with the weapons to finish it! One of the newest and most effective is this giant Mack Army Prime Mover.

Made-to-Order

for the World's Toughest Customer...

The Army's newest and biggest prime mover is probably the best single job in truck history. Most of its details can't be made public... but you can see for yourself that it's *big*. And we can tell you that it hooks up to a whale of a big gun, takes on a terrific load and goes almost anywhere except straight up. We're proud of it, at Mack, and with good reason. Proud that the Army called on Mack men and facilities to develop and build it. Proud, as Americans, that our fighting men are getting fighting equipment so fine. And proud that this, too, is "built like a Mack truck"... with all that phrase has stood for in ruggedness and reliability for forty-two years!

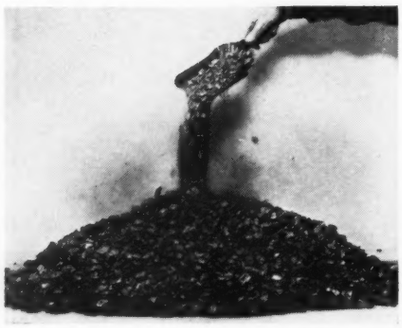
Mack Trucks, Inc., New York, N. Y. Factory branches and dealers in all principal cities for service and parts.

Mack

TRUCKS
FOR EVERY PURPOSE
ONE TON TO FORTY-FIVE TONS

BUY U. S. WAR BONDS

IF YOU'VE GOT A MACK, YOU'RE LUCKY... IF YOU PLAN TO GET ONE, YOU'RE WISE!



Coaladd

The Coal-Dust Killer with All Plus-Values

Satisfies Consumers

1 . . . COALADD is permanent in its effect, staying with the coal from loading pocket to furnace

2 . . . it spreads by contact to fresh surfaces caused by breakage during handling

3 . . . it helps to prevent freezing

4 . . . it cuts down on fly ash

Satisfies Operators

1 . . . COALADD is economical and easy to apply at the mine

2 . . . it is non-corrosive, attacking neither metals nor rubber belting

3 . . . it is obtainable in any quantity and does not make use of any critical war material

COALADD is all "plus-value". It makes coal better merchandise and makes users better customers.

Dust-treatment of coal before shipment to market is *the coming thing*. Already many thousands of tons are treated daily with COALADD. Why not make a thorough test of COALADD at one of your loading pockets. It costs little to do this. It may show you how to improve your dealer relationship.

THE JOHNSON-MARCH CORPORATION

52 Vanderbilt Ave., New York, N. Y.

12-JM-4

FRANK STALLINGS, formerly connected with the Elk Horn Coal Corp., Wayland, Ky., has become general manager of the Princess Elkhorn Coal Co., Prestonburg, Ky.

R. E. SNOBERGER, executive vice-president, Binkley Coal Co., Indianapolis, Ind., has been elected a member of District 11 Producers' Board, vice J. F. MOLONY, of the same company.

HAROLD B. WICKEY, formerly safety director for the Davis Coal & Coke Co., Thomas, W. Va., has joined the staff of the Mining Branch, War Production Board, as an assistant technical adviser on mine priorities.

•

Coal's Part Publicized

The Logan Coal Operators' Association and the employees and management of the Seymour Coal Mining Corp. are among the latest companies and organizations to adopt newspaper advertising to carry the story of coal's achievements to the general public. The Logan association on Nov. 15 published the eighth in a series of full-page advertisements in Huntington (W. Va.) and other newspapers on coal and its important place in the national economy. Subjects discussed have included coal as a "cash crop," expenditures for wages, materials, taxes and workmen's compensation, and the importance of the industry to railroads, suppliers and the consuming public at large.

"Praise the Lord and Pass the Ammunition" was the theme of a full page in the Nov. 5 Herrin (Ill.) *Daily Journal* by Local 2678, United Mine Workers of America, and the Seymour Coal Mining Corp. Stressing the part of the organization in furnishing fuel for munitions and other essential war work, the advertisement pointed out that every one connected with the company invests 10 percent or more of his gross earnings in War Bonds. The latter step was recommended to all readers as a vital method of quickly beating the Axis.

•

Binkley Driving Slope Mine

A slope mine is being developed by the Binkley Mining Co. in connection with its Bobolink No. 7 stripping operation at Seelyville, Ind. The slope is to be about one-half mile from the present tipple.

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Obituary

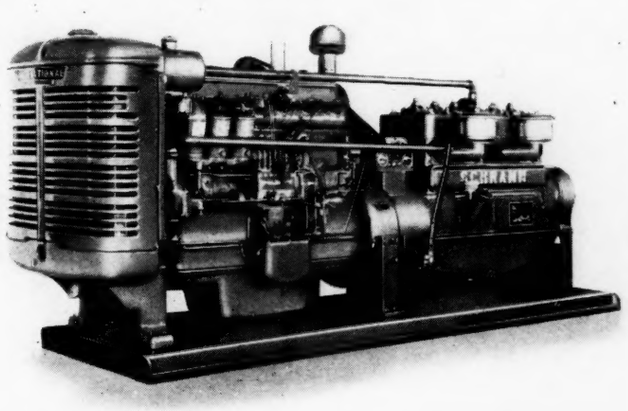
GEORGE GIBBS, 54, who had been active in the Williamson (W. Va.) field for nearly 20 years, died Oct. 26 at his home in Sprigg, W. Va. Born in Jacksonville, Ohio, he operated mines in his native State before moving to West Virginia in 1924. At the time of his death he was president of the Dayton Coal Co., Alma Fuel Co. and Merrimac Coal Co., all of Sprigg.

GEORGE H. PATTON, president, Thomas Coal Co., Bramwell, W. Va., died suddenly Nov. 21 of a heart attack at his home in Chattanooga, Tenn.

It's Opening Up a New Coal Shaft

Working just ahead of this powerful compact SCHRAMM COMPRESSOR a small "task force" of semi-skilled labor has cut down timber with air-driven saws, drilled and blasted obstructions, chipped boulders and tamped the fill for the road that will lead to a new mine shaft. Speed was necessary and Schramm provided the unfailing air power to complete the work ahead of schedule. . . . Jobs like these, as well as guniting, paint spraying, and other construction and maintenance work keep Schramm Compressors busy throughout America's principal coal fields.

They're a dependable source of economical power —regardless of temperature or altitude. For *all* Schramm Compressors have straight-lined cylinders, water-jacketed for correct lubrication at all temperatures . . . Mechanical intake valves. . . . Operate at most economical engine speed, using less fuel for air delivered . . . No auxiliaries to buy—shipped ready for action . . . Distributors and Service Stations convenient to coal mining centers both here and abroad. *Write today for new catalog 42SP. Has complete illustrated data and prices.*



GASOLINE . . . DIESEL . . . ELECTRIC in portable or stationary models ranging from 20 to 600 cu.ft. Illustrated above is self-aligned, direct connected diesel engine driven compressor of 315 cu.ft. actual air delivery. This is a complete unit furnished as shown on deck type base.

SCHRAMM
INCORPORATED

THE COMPRESSOR PEOPLE

WEST CHESTER, PENNA.

Illinois Mining Institute, in 50th Year, Concentrates on Problems of the Day

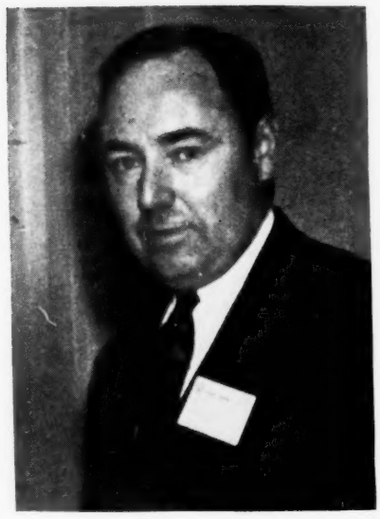
Federal Coal-Mine Inspection Set-up Analyzed—Scrap From Coal Mines Urgently Needed—Rock-Dusting System Demonstrated—On-Shift Shooting Asked for Illinois—Priorities and Materials Outlook Analyzed—Smokeless Combustion of Coal Explained

CELEBRATION of 50 years of service to the coal industry of Illinois and the United States was combined with discussion of problems of the day at the golden anniversary meeting of the Illinois Mining Institute, Hotel Abraham Lincoln, Springfield, Ill., Oct. 23. With the membership expected to pass the 1,000 mark in the near future, the institute, among other things, is increasing its mining scholarships from two to four. Similarly, it was announced, the Peabody Coal Co. is increasing from two to eight the number of scholarships it maintains.

Third oldest of U. S. mining institutes still functioning today, I.M.I. was founded in 1892, with James C. Simpson, general manager, Consolidated Coal Co., St. Louis, Mo., as president. The question of organizing was first broached at a dinner given to members of the Miners' Examining Board by Mr. Simpson some time in 1891. Formal organization was completed at the State House, Springfield, Ill., Feb. 17, 1892. There were 27 charter members and 107 additional members were elected at the first meeting.

Introduction of twelve past presidents (not including J. A. Jefferis, then still in office) was a feature of the dinner session. Heading the list was Thomas Moses, who held office in 1913-14. The others were: J. W. Starks, 1914-15; F. S. Pfahler, 1916-17; D. D. Wilcox, 1923-24; John E. Jones, 1928-29; George C. McFadden, 1931-32; H. A. Treadwell, 1933-34; W. J. Jenkins, 1936-37; H. H. Taylor Jr., 1937-38; Paul Weir, 1938-39; R. L. Adams, 1939-40; and Dr. M. M. Leighton, 1940-41. Other living past presidents not able to be present are: Frank F. Tirre, 1920-21; John G. Millhouse, 1922-23; William E. Kidd, 1926-27; James S. Anderson, 1927-28; A. C. Callen, 1929-30; and T. J. Thomas, 1935-36.

Carl T. Hayden, vice president and general manager, Sahara Coal Co., Chicago, was elected president for the coming year, succeeding J. A. Jefferis, Illinois Terminal R. R. System. Resolutions adopted included one praising the work of the Mining Branch of the War Production Board and asking continued assistance for it in serving the vital coal-mining industry.



Carl T. Hayden, new I.M.I. president.

At the head table: Carl T. Hayden, J. A. Jefferis, B. E. Schonthal, Thomas Moses (toastmaster), Dr. Wilbur A. Nelson and Dean Charles Thompson

I.M.I. and Peabody scholarship holders: Marion B. Walls, Robert N. Morris, Robert R. Lipe and Robert M. Stephens

The operation of federal coal-mine inspection was outlined by E. H. Denny, chief, coal-mine inspection division, U. S. Bureau of Mines, Washington, D. C., to start off the morning technical session, presided over by D. D. Wilcox, general superintendent, Superior Coal Co., Gillespie, Ill. Describing the set-up to attain the objectives of the coal-mine inspection act, Mr. Denny pointed out that it called for the appointment of 107 inspectors, five explosives engineers and five electrical engineers. To date, some 800 men have passed the examinations.

Inspections so far have been made largely in mines employing over 25 men, but a few smaller operations have been examined. The number of mines inspected has been 500 or so. The standards of inspection are largely governed by Bulletin 7204 of the U. S. Bureau of Mines. Some mines, well along in their life, cannot be changed readily to conform to the standards set up. These days, however, coal must be mined, and substitute standards may be temporarily necessary. Cooperative effort is essential, and safety work should not be permitted to slacken because of war. It is now more necessary than ever, Mr. Denny declared.

Supplementing an exhibit showing the equipment necessary and its operation, John E. Jones, safety director, Old Ben Coal Corporation, West Frankfort, Ill., explained and demonstrated the rock-dusting system which he developed and patented a few years ago (*Coal Age*, October, 1940, p. 40). Briefly, it consists of suspending bags of rock dust on drop boards with the necessary vane and trigger arrangements for tripping the boards under the influence of the pressure wave preceding an explosion. When a bag drops, the top is ripped out by wires, exposing the dust to the air current, which picks it up and disseminates it. The distance the board can drop is limited so

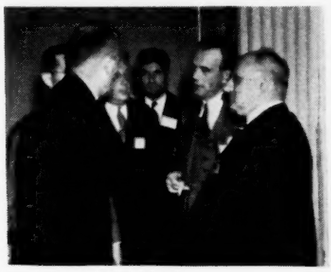
John E. Jones demonstrates his rock-dusting system

Speakers and gavel wielder: E. H. Denny (left), D. D. Wilcox, R. E. Snoberger and Howard Lewis.

D. L. McElroy (second from right) makes a point after the meeting.

Harry Moses (left), H. C. Frick Coke Co.; P. D. McMurrer, American Mining Congress, and George F. Campbell, Old Ben Coal Corp.

B. H. Schull (left), new institute vice president, with C. W. Woosley, Pyramid Coal Corp., and Francis Murphy, Illinois Labor Director.



Fred Weissenborn, Illinois Coal Operators' Association, meets with F. S. Pfahler, Superior Coal Co., and Prof. H. L. Walker.

Lawrence Kiss and Herman Seekamp, Superior Coal Co., reminisce with Tom English, Illinois Department of Mines and Minerals.

Lee Conway, Consolidated Coal Co., Peter Fisher, Gillespie Mine Rescue Station, and Tom English go over a few matters.

R. J. Paul, Allis-Chalmers, and Jack Bullington, Truax-Traer Coal Co., pose for the Coal Age camera.

H. A. Cross, Walter Bledsoe & Co., chats with G. M. Glidden, E. D. Bullard Co., and Richard Wilcox, Superior Coal Co.

J. R. Fellows with his smokeless combustion demonstrator and Prof. Harold L. Walker, University of Illinois.

Round table: Ed. Hasenjaeger, C. C. Conway (represented by his pipe), Stuart Jenkins and W. J. Jenkins, all of Consolidated Coal Co., with A. S. Knoizen, Joy Mfg. Co.

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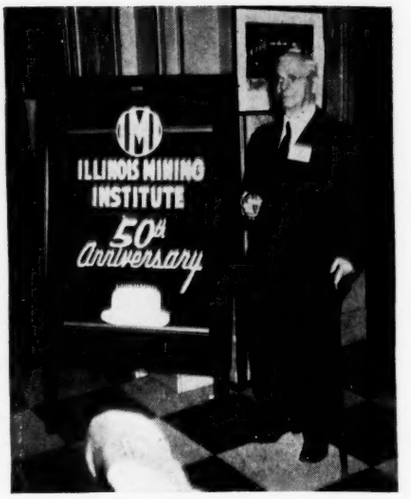


J. A. Jefferis, retiring I.M.I. president, with the birthday cake.

that the bag is held up until all the dust can be picked up by the air current, rather than drop toward the floor in a mass.

Convenience in installation and removal to other locations, prevention of rock-dust waste and 100-percent availability in case an explosion should occur were some of the advantages cited for the system. Equipment details and rights of use are free to all who apply, Mr. Jones declared.

An urgent plea for more scrap metal from the coal-mining industry was made by R. E. Snoberger, industrial salvage section, Bureau of Industrial Conservation, War Production Board, Washington, D. C. Pointing out that iron and steel scrap is needed in large volumes if the United States is to maintain its war effort, Mr. Snoberger stated that the original voluntary system of finding materials has now been supplemented by inspection of coal mines. This is being carried on by representatives of the U. S. Bureau of Mines and the federal coal-mine inspectors, and includes an inventory of mining equipment not now in use and available for transfer elsewhere, in addition to scrap proper. The next six months, said Mr. Snoberger, probably will be the most critical, and the job calls for every possible effort by coal-mining companies. Collection of scrap with a money value smaller than the cost of recovery is being handled by a special government agency.

Stating that times have changed and the continued welfare of the Illinois coal-mining industry is at stake. Howard Lewis, underground superintendent, Old Ben Coal Corporation, West Frankfort, Ill., presented a vigorous plea for relaxation of legislative restrictions preventing shooting on the shift in Illinois. Laying the blame for the decline of deep mining in Illinois, including Franklin County, where 14 mines have been closed since World War 1, on the "Illinois Shot Firers' Act, which became the law in this State more than 37 years ago," Mr. Lewis pointed out that "last year about 36 percent of the Illinois production of coal came from sources other than deep shafts, such as strip mines and local mines. This alone is significant of

the trend of shaft mining unless corrective measures are taken without delay."

Declaring that face preparation has "become a vital matter in the mechanized mines of today," Mr. Lewis contended that permission to shoot on the shift would permit better gaging of the sizes produced to the demands of the market, promote safety through ability to inspect and take care of hazardous conditions immediately, rather than waiting until the next day, and enable mines to greatly expand their output by working multiple shifts with a continuous cycle of face operations.

"Let us suppose that the Illinois Shot Firers' Act, by executive order, should be applied to all coal mines in the United States today. In a short time the coal production of the nation would drop sharply. Perhaps half the mines would be unable to continue operation. Those mines now operating double and triple shifts would, for the most part, find it impossible to produce coal more than one shift per day. Mines working coal seams carrying one or more large bands of impurities would be among those to close immediately. A crisis would exist the life of which this nation has never seen. The price of coal, now limited as to both maximum and minimum, would have to be raised to a figure never heretofore reached if production in any more than half a dozen fields of the nation was continued on a sound basis. . . .

"On-shift shooting has always been the practice in the two largest coal-producing states of the nation—namely, Pennsylvania and West Virginia. We cannot say that these commonwealths are indifferent or negligent toward their people who work in the mines. We cannot say that they have failed to keep in step with progress in coal-mining methods. If on-shift shooting were not being done in the mines of

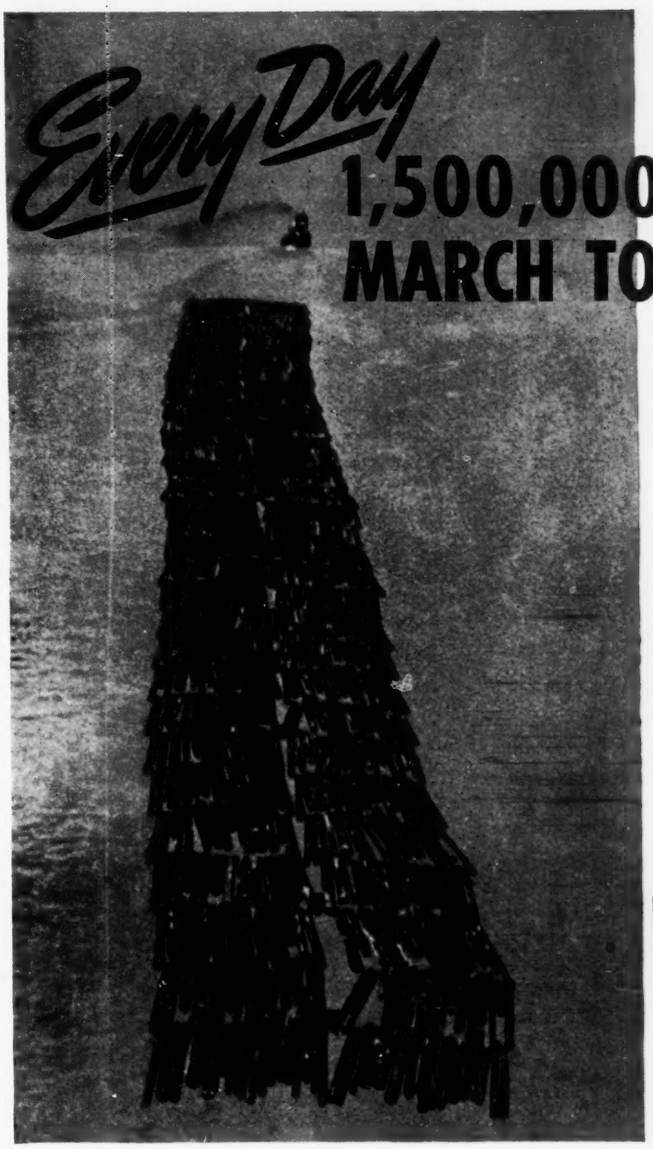
ILLINOIS OFFICERS

Carl T. Hayden, vice president and general manager, Sahara Coal Co., Chicago, was elected president of the Illinois Mining Institute at the 1941 meeting. He succeeds J. A. Jefferis, Illinois Terminal R.R. System, St. Louis, Mo. Other officers were chosen as follows:

Vice President—B. H. Schull, vice president in charge of operations, Pyramid Coal Corp., Terre Haute, Ind.

Secretary-treasurer—B. E. Schonthal, B. E. Schonthal & Co., Chicago.

Executive Board—New members elected for three years were: W. J. Jenkins, Consolidated Coal Co.; F. S. Pfahler, Superior Coal Co.; Prof. H. L. Walker, University of Illinois; and James M. White, Franklin County Coal Corp., Inc. Members carried over were: J. G. Crawford, Howard Lewis, R. M. Medill, Byron Somers, C. W. Woosley, B. R. Gebhart, Lee Haskins and Carl Lee.



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Coal Men on the Job

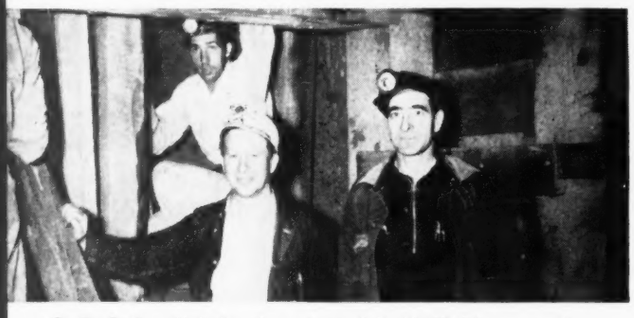
Joseph Pursglove, Jr., general manager, Pursglove Coal Mining Co., Pursglove, W. Va.

William Crichton, vice president, Johnstown Coal & Coke Co., Crichton, W. Va.

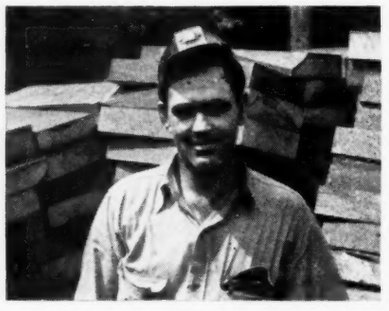
F. W. Budde, treasurer, Utilities Elkhorn Coal Co., Pikeville, Ky.

Day shift, Imperial Smokeless Coal Co., Quinwood, W. Va.: standing, left to right, A. W. Robey, Steve Arnott, section foremen; C. B. Jennell, chief electrician; J. W. Johnson, engineer; kneeling, W. S. Hunt, Smith Legg, section foremen; W. M. Kennedy, mine foreman; Britt Beasley, section foreman.

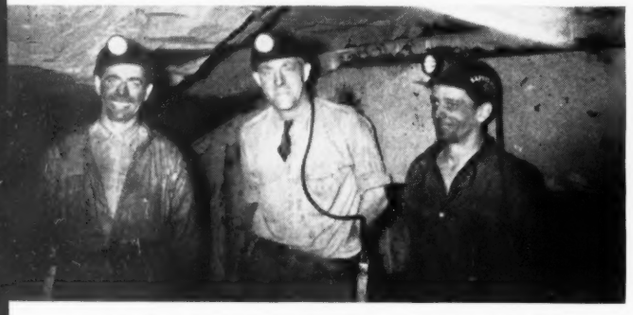
C. W. Wilson, shop foreman, the Enos Coal Mining Co.



G. B. Staley (left front) supt., and L. H. Hinkle, general mine foreman, Margarette Coal Corp., Marfrance, W. Va.

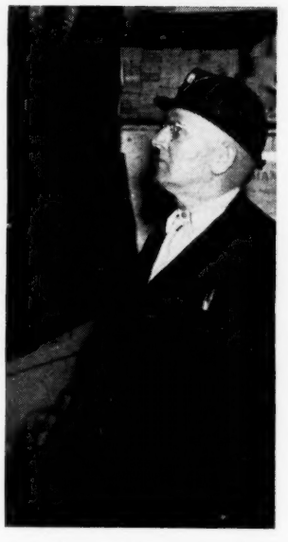


J. L. Thompson, day-shift section foreman, Utilities Elkhorn Coal Co., Esco.



Mart Bailey (left), general mine foreman; A. O. Coleman, superintendent; and C. D. Halbert, day-shift section foreman, Utilities Elkhorn Coal Co., Esco, Ky.

Charles Calhoun, chief electrician, Utilities Elkhorn Coal Co., Esco, Ky.



David Pursglove, superintendent, Pursglove No. 2 mine, Pursglove Coal Mining Co., Pursglove, W. Va.

L. D. Miller (left), superintendent, and J. D. Black, chief electrician, Leslie mine, New River & Pocahontas Consolidated Coal & Coke Co., Leslie, W. Va.

Paul Mullins, tipple foreman, Utilities Elkhorn Coal Co.

by Editors on the Job

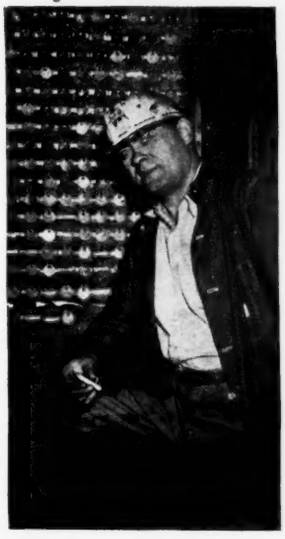
Charles Smothers, asst. supt., Delta Coal Mining Co., Carrier Mills, Ill., and "Poss."

D. G. Baird, cashier, Utilities Elkhorn Coal Co., Esco.

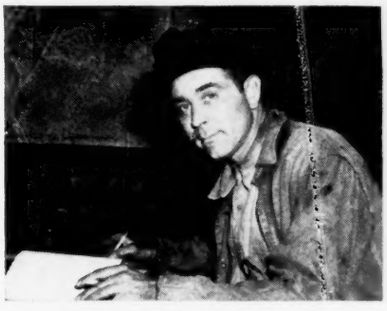
Victor Zeni, chief electrician and master mechanic, Pursglove Coal Mining Co.

J. B. Scarberry, chief elect., Margarette Coal Corp., Marfrance, W. Va.

Underground day shift, Pursglove (W. Va.) No. 2 mine; back row, left to right, W. N. Molnar, mine foreman; Ola Sines, Charles Swope, James Reeves, M. B. Wickline, section foremen; front, Matthew Kendo, section foreman; James McGraw, asst. foreman; L. R. Galeota, R. H. Jones, section foremen.



H. R. Sutphin, superintendent, Nos. 1 and 2 mines, Johnstown Coal & Coke Co., Crichton, W. Va.



Leslie Clark, supt., Imperial Smokeless Coal Co., Quinwood, W. Va.

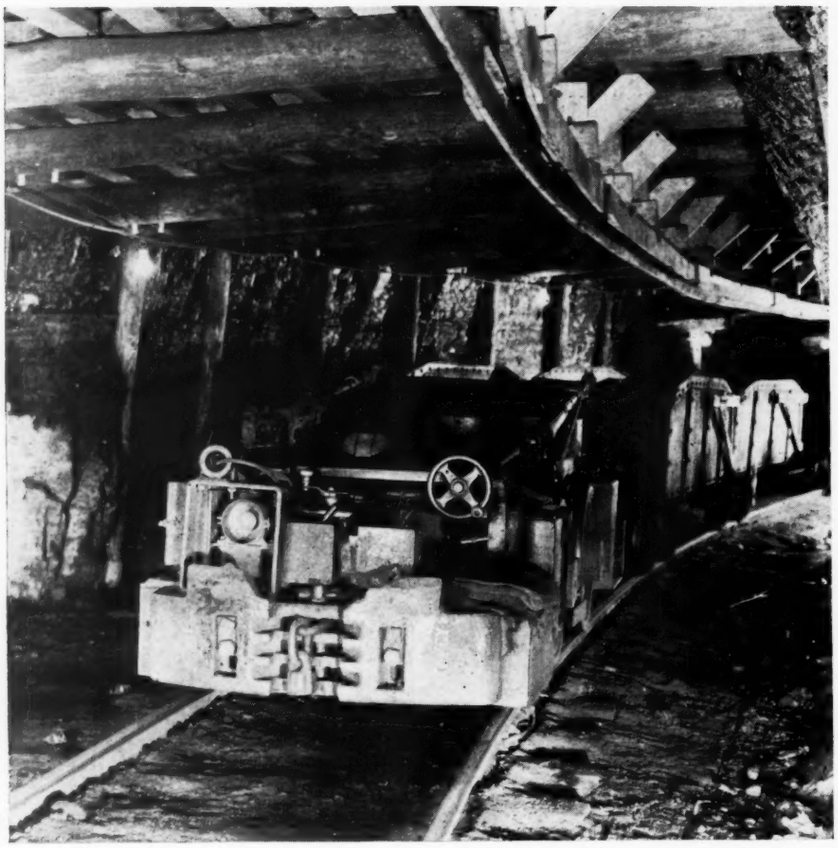
J. S. Forman, gen. mgr., Mt. Olive & Staunton; C. C. Conway, Consolidated; Tom Garwood, C. W. & F.; Carl Campbell.

Ted Bergrun, chief electrician, Midland Electric Coal Corp., Farmington, Ill., with his son, a Cornell student.

Kelly Walters (left), night foreman, and Earl Ditty, section foreman, Utilities Elkhorn Coal Co., Esco, Ky.

L. W. King, master mechanic, and A. J. Kidwell, asst., Enos Coal Mining Co.

Angelo Zeni (right), chief electrician, and Martin Knouse, electrician, "A" side, Pursglove No. 15 mine, Pursglove Coal Mining Co., Pursglove, W. Va.



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these two states in comparative safety to life, limb and property it would not be permitted.

"Only in recent weeks have the shaft mines of southern Illinois been permitted to expend their full capacity in the production of coal for the war effort, but the on-shift-shooting mines of the nation have been going at full capacity, working double and triple shifts for the past two years. . . . It is time that all interests—operators, mine workers, legislators, the Department of Mines and Minerals, civic organizations, business interests affected by coal—got together for the common purpose of revising the laws, rules and regulations in line with progress in mining methods for the good of the industry and the people who depend upon it for a living."

Burning Coal Smokelessly

"Present and Future Possibilities for Smokeless Combustion of Illinois Coal," by Prof. J. R. Fellows, Department of Mechanical Engineering, University of Illinois, was the opening paper at the afternoon session, presided over by Mr. Hayden. Pointing out that the university has carried on extended research in the economical and smokeless combustion of Illinois coals, Prof. Fellows remarked that the manufacture of new designs of stoves and furnaces for smokeless hand-firing of Illinois coal is out for the duration. He demonstrated and described, however, a simple auxiliary firebox which can be applied to existing furnaces for improving efficiency and reducing smoke output, and detailed several methods of hand firing designed to reduce smoke emission, calling attention to the new free bulletin (No. 46) of the University of Illinois Engineering Experiment Station on this subject.

How priorities work to keep materials and supplies moving to the coal industry and some of the probable future prospects were outlined by D. L. McElroy, chief, coal section, Mining Branch, War Production Board, Washington, D. C. Mr. McElroy's address was given in full in the November, 1942, issue of *Coal Age*, p. 49.

Toastmaster at the annual banquet was Thomas Moses, retired president, H. C. Frick Coke Co., and one of the twelve living past presidents of the institute present at the anniversary celebration. Speakers were Dean Charles M. Thompson, College of Commerce and Business Administration, University of Illinois, and Dr. Wilbur A. Nelson, chief, Mining Branch, War Production Board. The times, declared Dean Thompson, demand that we abstain from faulty thinking and analyze what is before us.

Surveying the present status of the mining industry, with special reference to coal, Dr. Nelson declared that "Coal is the most fundamental material we have." Its production requires both men and materials, and continuance of this production "is essential to our existence." Steps are being taken to assure the needed manpower, one evidence being the return of 4,000 men to the copper mines from the Army. From the standpoint of materials, we are on our way to "airtight control." Allocation will take the place of

the priorities system to make more certain that materials will go to the places they are most needed. Every effort, he pledged, will be made to see that mining receives proper consideration, because "mineral production is the key to victory."

Review of Minimum Coal Prices Asked by New York Group

Associated Industries of New York, a membership corporation comprising 1,356 persons, firms and corporations doing business in New York, petitioned the U. S. Court of Appeals for the Second Circuit, Oct. 27 for a review of orders establishing the new minimum price schedules for bituminous coal. Alleging that it is unlawful to adjust the weighted average cost of producing coal in Minimum Price Area 1 for the year ending Dec. 31, 1940, from $1.9408, as determined, to $2.2503, and that it is improper to make a further addition of approximately 7c. per ton as the alleged deficiency in realization at minimum prices during the period Oct. 1, 1940-Sept. 30, 1941, on the assumption that all sales were made at minimum prices, the petition asked that the respondents "be directed to certify and file in this court a transcript of the record, or so much thereof as may be pertinent," upon which the orders of Aug. 28 and Sept. 30, 1942, were based, and that the court review the orders, particularly as to the prescribed increases in prices on coal from Minimum Price Area 1, and set aside the parts of those orders complained against and grant other relief "as may be just and proper."

Factors in Vibrating-Screen Choice and Use Detailed at Illinois Preparation Meeting

SCREENING coal with vibrating equipment was the subject of discussion at the meeting of the Illinois Society of Coal Preparation Engineers and Chemists held Oct. 16 at the Benton [Ill.) Country Club, with J. E. Dunn, sales representative, Allis-Chalmers Mfg. Co., as the principal speaker. Mr. Dunn stated that the first application of reciprocating screens in Illinois was in the Wilmington field in 1884.

"The vibrating screen was developed in the early part of 1920, but it met with very little success in the coal-mining industry until about 1925. The gradual improvement in anti-friction bearings, development of high-tensile steels, improvement in methods of manufacture, such as welding, coupled with proper application, has led to the present success of vibrating screens."

Vibrating screens may be grouped according to whether they are mechanically or electrically vibrated. Specifications for the more usual mechanical types are:

1. Four-bearing mechanism with two eccentrics and two outer bearings; 700 to 1,300 r.p.m.
2. Two-bearing eccentric; 700 to 1,300 r.p.m.
3. Off-center weight, inclined; 1,200 to 1,800 r.p.m.
4. Horizontal, actuated by an inclosed mechanism of accurately calibrated off-center weights geared together, suspended by wire cables; 850 to 1,200 r.p.m.
5. Horizontal, actuated by an eccentric shaft through reeds and springs, floor mounted; 850 to 1,200 r.p.m.

"The correct operating speed depends upon the throw, which in turn depends upon the type and size of screen cloth, size of coal and nature of application."

Electrically vibrated screens are built for similar application, but differ in principle, amplitude and performance. The amplitude usually is about $\frac{1}{32}$ in., but some are designed for greater amplitude. Table gives data on applications.

The selection of a vibrating screen for a given separation is dependent on a number of factors. These are, briefly:

1. Headroom, to determine use of inclined or horizontal type.
2. Representative screen analysis of feed; average and surge load conditions; type of mining; whether run-of-mine, crushed or washed coal; surface moisture.
3. Well-designed screen to avoid shutdowns and high maintenance.
4. Selection of proper amplitude, throw, slope and speed to obtain desired rate of travel to stratify the bed of coal properly and bring fine particles in contact with screen surface.
5. Proper screen surface with sufficient open area.
6. Depending on angle of operation, size of coal, etc., mechanism must operate in proper direction—with or against flow.
7. Initial cost in proportion to application.
8. Maintenance expense.

Usually, if feed is 75 percent of rated capacity, efficient screening may be expected. If the screen is too large, material will bounce around; if too small, the material bed is too deep and stratification will not be good. Increasing the width of a screen decreases depth of bed or in-

APPLICATIONS OF VARIOUS SCREENS

Feed	Tonnage	Separation	Type of Screen	Inclination, Deg.	Amplitude, In.
Run-of-mine	Large	5 in. round to 10 m.	2 and 4-bearing	15 to 25	$\frac{3}{16}$ to $\frac{1}{2}$
Medium fine screening	Small	1½ in. to 10 m.	Off-center, 2 and 4-bearing	25 to 30	$\frac{1}{16}$ to $\frac{3}{16}$
Medium fine and fine screening	Small	¼ in. to 10 m.	Electrically vibrated	35	*

A NEW APPROACH TO AN OLD PROBLEM!

Stopping water with Volclay employs an entirely different principle from cement, or paint, or bitumen.

The "successful results" reports of Volclay usage range from household laundry tubs to 10,000,000 gal. concrete reservoirs; from farmer's stock ponds to mighty dams.

Engineers will find hitherto unrealized possibilities in Volclay for:

Sealing leaky bulkheads, cofer dams, old bore holes

Grouting fissures and cracks

Stopping leakage from concrete reservoirs

Reducing seepage through earth-lined ditches, ponds, dams

And most other water sealing problems in mine operation

Write us about your water seepage problems and get our engineering opinion and recommendation without obligation.

AMERICAN COLLOID COMPANY

363 W. Superior St.
Chicago, Ill.

creases capacity. Increasing the length increases efficiency, capacity remaining constant. Generally, a screen should be 2½ times as long as wide.

The following factors should be considered when selecting the proper screen surface: (1) Maximum size of feed; (2) surface moisture of feed; (3) particle shape, whether cubical, elongated or slabby; (4) high percentage of open area.

Screen surfaces with square openings generally are used for ½-in. and larger coal and, where accurate sizing is desired, square openings must be used for the finer sizes. Rectangular openings are recommended for coal under ½ in. because of increased capacity with this type of cloth. However, before selecting rectangular openings, consideration must be given to the percentage of salable coal that will pass into the carbon. Sizing cannot be accurately controlled when using rectangular openings.

This thumb rule may be used for selecting screen cloth: Select square holes 80 to 83 percent of the diameter of round holes. Width of rectangular holes should be approximately 66 percent of the diameter of round holes.

Bed Depth With Moist Coal

When handling moist coal, depth of bed should not be more than 75 percent of the particle size. For example, with 1x0-in. coal on ½-in. openings with 4 or 5 percent surface moisture in the ¼x0-in. size, the depth of bed should not exceed ¾ in. If the ¼x0-in. carries less than 3 percent moisture, depth of bed may be increased.

The rate of travel of coal over the deck depends on a combination of factors, as r.p.m. of screen, size of coal, particle shape, quantity of fines in the feed, moisture, depth of bed, etc. Recent tests indicate that increased amplitude and throw are desirable for screening coal, especially moist coal, even down to the finer meshes. Field tests on this subject are being conducted.

The speed of a screen is selected according to the amplitude or throw to maintain proper bearing factor (safety) and to keep the stress of structural parts within reasonable limits.

From the standpoint of sizing, blinding, etc., the separation obtained depends upon the surface moisture of the coal. This is not serious with the larger meshes, but for smaller meshes, such as 10-mesh to ¼-in., it is necessary preferably to determine size distribution of moisture. Various ideas have been developed to eliminate blinding, such as chains in the screen surface, rods below, or rubber balls underneath to create a secondary cloth vibration. Stainless-steel cloth is recommended for screening moist coal, regardless of the method used to create secondary vibrations.

"Screening efficiency is a subject that needs clarification." The usual method of determination is to take a sample of oversize off each deck, split the sample to proper size, weigh, screen on testing sieves with openings equivalent to those used in vibrating screens, and calculate the quantity of undersize in the oversize, based on the total weight of the sample. A screening efficiency of 90 percent is considered good. Variations will reflect irregularities in feed, change in screen analysis, change in moisture, etc. "It would be advisable to consider the adoption of a free tolerance for all separations. For instance, in screening at ¼-in. square, the tolerance should apply to near-size particles within this range, and this is a subject that should be given thought for future discussions and recommendations."

•

New Office at Pocahontas, Va. Taken by Pocahontas Fuel

Early in November, the Pocahontas Fuel Co., Inc., Pocahontas, Va., moved its offices into a new strictly fireproof three-story building one-half block from the old wooden structure which had housed the retail store and offices for close to 50 years. The new building is a 62x120-ft. brick-faced structure with dark granite trim on the front and with metal window and door sash and casings throughout. The first floor is allotted to the purchasing department, the second to the accounting, and the third to the mine-operating and engineering departments.

Nothing was left undone to make the building serve to the best advantage and provide a permanent and low-maintenance structure. The building has an automatic elevator and includes a vault on each story, each vault room with metal shelving. Main rooms where stenographers and clerks are employed and where adding machines and typewriters are in use are soundproofed. Fluorescent lighting was laid out to give intensity and distribution calculated to be the ideal for office work.

The company operates 13 mines in the counties of Tazewell, Virginia, and McDowell and Mercer, West Virginia, and is now producing at the rate of over 8,000,000 tons per year. The original company, organized in 1881, was the Southwest Virginia Improvement Co. In 1901 the name was changed to the Pocahontas Collieries Co., and the present name was adopted in 1917, when the sales and mining companies were consolidated. In 1923 a tract of 30,000 acres was purchased from the H. C. Frick estate and title to this fee land was vested in a subsidiary company, the Pocahontas Corp. Seven mines of the company are drained by an 18.6-mile tunnel completed in 1936 (Coal Age, January, 1937, p. 3). Executives and officials headquartering at Pocahontas are: W. J. German, general superintendent; A. V. Sproles, assistant general superintendent; R. E. Toy, purchasing agent, and W. A. Bishop, chief engineer.

•

United Electric Lauds Its Miners For Output and Safety Record

United Electric Coal Cos., Chicago, praises safety and production records of its Cuba (Ill.) mine staff during the seven months ended Sept. 30 in a statement accompanying photographs of the men.

"United Electric is proud to honor the men of Cuba mine," says the statement, "for their achievement in establishing a new safety record—seven months without a lost-time accident, an enviable record rarely achieved in any mine—and for the large tonnage of coal they have produced during this seven-month period, when it was so urgently needed for war industries, railroads, utilities and domestic use." The company also stated that its Fidelity, Buckheart and Red Ray mines have set new records in the volume of coal produced during the last year.

•

"Desilting Basins" Suggested

Construction of "desilting basins" on the Schuylkill River below the coal fields to remove solids resulting from mine operations has been suggested to Pennsylvania water and sanitary authorities by representatives of the anthracite industry.

Pocahontas Fuel Co.'s new headquarters at Pocahontas, Va.

Commenting on the proposal, Dr. A. H. Stewart, chairman of the Commonwealth Sanitary Water Board, is reported to have characterized the plan as "the most practical method that has been suggested to alleviate the condition of this river." He added, however, that complete removal of solids "was impossible by any method presently known to industry."

•

Stoker Heating Guide Tells How to Improve Results

A new edition of its stoker heating guide is offered by *Coal-Heat* Magazine, K. C. Richmond, editor, Chicago. Intended for the household user, the guide is designed to improve heating results, protect health, reduce heat losses, save fuel and cut costs by advising on the operation and maintenance of a heating system. Single copies are 10c.; by the hundred, $6.

•

Hanna Acquires U. S. Coal Co.

M. A. Hanna Co., Cleveland, Ohio, has purchased the United States Coal Co., also of Cleveland, it was announced on Nov. 24. With the latter's output, estimated for this year at 620,000 tons, Hanna's annual coal production will be increased to about 5,020,000 tons. The Hanna Coal Co. output is about 3,300,000 tons and that of the subsidiary Jefferson Co., about 1,100,000 tons.

•

New Preparation Facilities

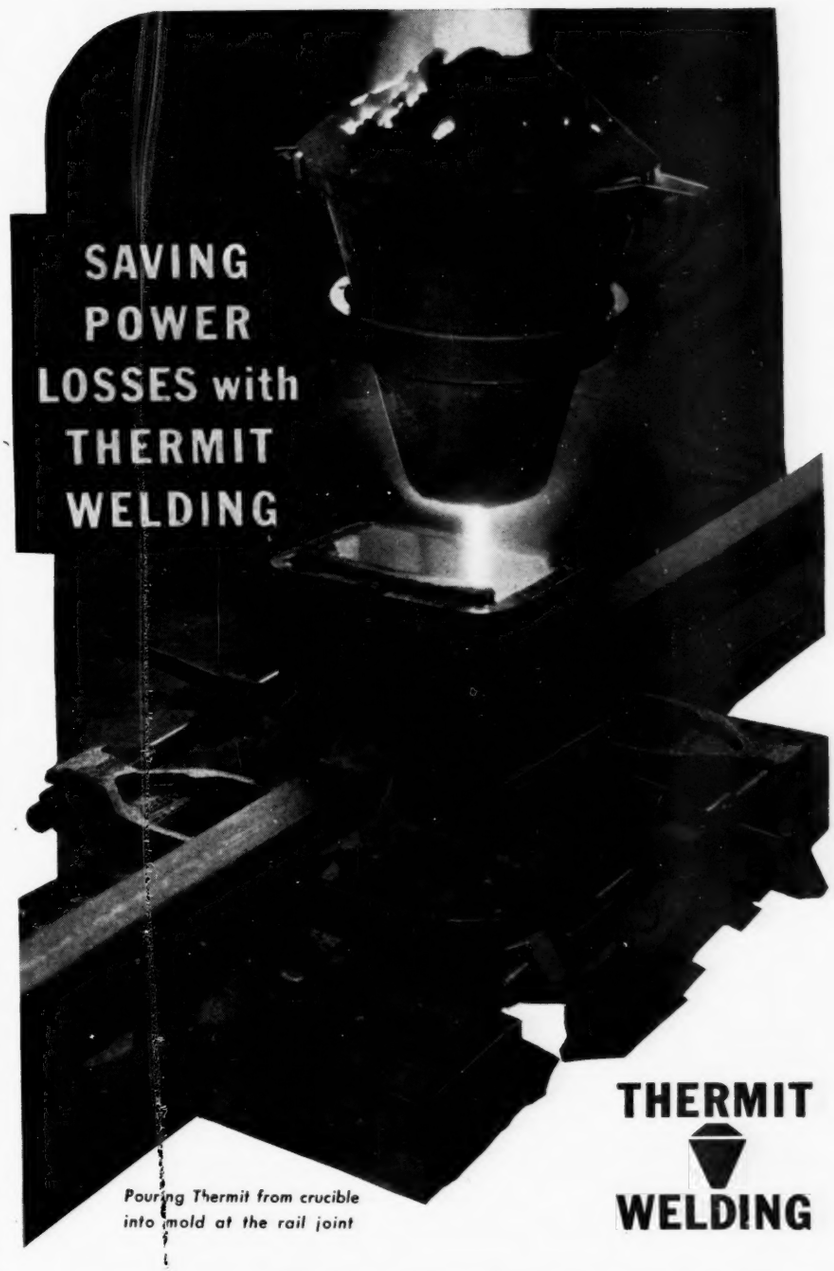
Hume-Sinclair Coal Mining Co., Hume, Mo.—Contract closed with Centrifugal & Mechanical Industries, Inc., for a C-M-I continuous centrifugal dryer to handle slurry; to be completed about Dec. 15.

Kelleys Creek Colliery Co., Mine No. 4, Ward, W. Va.—Contract closed with Kanawha Mfg. Co. for additions and alterations to tipple to make egg, stove and dedusted nut-slack sizes; equipment includes blending and loading units and Robins 5x10-ft. double-deck Gyrex screen; capacity, 200 tons per hour.

Rhoads Contracting Co., Park No. 1 Breaker, Ashland, Pa.—Contract closed with Wilmot Engineering Co. for addition to existing steam-coal cleaning plant; equipment to include one 15-ft. Chance cone to clean stove, nut and pea coal; capacity, 100 t.p.h. of clean coal; also one 5-ft. Wilmot Hydrotator for No. 1 buckwheat coal; capacity, 40 t.p.h. of clean coal.

Tunnel Ridge Coal Co., Candlemas Breaker, Silver Brook, Pa.—Contract closed with Wilmot Engineering Co. for one 6-ft. Wilmot Hydrotator to prepare 50 t.p.h. of clean No. 1 buckwheat coal.

Utah Fuel Co., Sunnyside Plant, Sunnyside, Utah—Contract placed through Link-Belt Co. with Centrifugal & Mechanical Industries, Inc., for C-M-I continuous centrifugal dryer to handle about 40 t.p.h. of $\frac{3}{16}$-in. x 28-mesh coal; to be completed about Jan. 15.



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IT has been estimated that approximately 20% more conductivity is obtained with continuous rail than with track where mechanical joints and rail bonds are employed.

Thermit welding fuses the rail ends, forming one continuous piece of rail, and eliminates all plates, bonds and lock washers.

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Send for booklet No. 116 on Thermit rail welding and the use of Thermit for the repair of heavy machinery in mine operations.

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Longer Work Week Held Up by Prices: Manpower Situation Gets Tighter

(*Continued from page 57*)

ratings may be applied was set, for the fourth quarter of 1942, at no more than that already set aside for the mining industry.

CMP, it is stated, will operate on the basis of matching requests for materials to available supplies. Under this plan, users will supply to "claimant" agencies in the War Production Board estimates of materials requirements. Seven claimant agencies have been set up: Army, Navy, Maritime Commission, aircraft scheduling unit, Board of Economic Warfare, Lend-Lease and the Office of Civilian Supply. The latter is the claimant agency for all producers, including mining, not otherwise represented, and to this agency will go the coal industry's requirements estimates and requests. These bills of materials will be broken down into quantities needed for construction and facilities, including machinery and equipment, production, and maintenance. When the claimant agencies have collected their data, it is presented to the WPB Requirements Committee and the respective Controlled Materials Divisions. When the sum of the various requests has been adjusted to the available supply, authorized quantities of the controlled materials will be allocated to the claimant agencies, which in turn will distribute them to the users.

Priority Number Provided

With his allocation, each user will be provided with an allotment number calling for specified quantities of materials for delivery in specified periods. Each user receiving an allotment number, under the present arrangements, also will receive a preference rating for obtaining materials other than those controlled. Carbon and alloy steel, copper and aluminum are the first controlled materials to come under the plan. As stated, other materials will continue to be distributed through the priority system. Provision is made for users to get steel, copper and aluminum under the existing priorities system and PRP until they qualify under CMP. Detailed estimates as to requirements, it is stated, must be submitted by Jan. 1, 1943, for the last three quarters of 1943 and the first quarter of 1944, with general estimates for the first half of 1944, so the Requirements Committee will have a general picture of the requirements 18 months in advance at all times.

To accomplish the new objectives of WPB, including administration of CMP, a reorganization program was initiated in November. Ferdinand Eberstadt, WPB vice chairman, was named program director, in direct charge of CMP, with Ernest Kanzler continuing as director general of operations. Industry branches were advanced to the status of divisions and were given more responsibilities in estimating requirements, expanding resources and controlling distribution of materials. Each of the 36 division directors will have attached to his staff a labor advisory committee, an industry advisory committee and a "sub" requirements committee consisting of representatives of the seven claimant agencies.

A distribution bureau will be included in the staff of the director general of operations. This bureau will take over the functions of the bureau of priorities control and will administer the distribution of materials through priorities, PRP and CMP. A number of industry divisions will be grouped under operating bureaus, with mining in the minerals bureau. Safety and technical supplies come under the equipment bureau.

Specific priorities actions in recent weeks included prohibition of iron and steel for making of a long list of products heretofore manufactured; restrictions on the use of alloy steel in the manufacture of earth-moving scrapers; pressure to get users to substitute, wherever possible, bessemer steel and rerolled rail for open-hearth steel; placing of construction machinery under production scheduling and allocation, with some types reserved for military needs; revocation of priority assistance for a number of non-military government construction projects; and extension of the date for producing large off-the-highway trucks and trailers (500 total authorized) to March 31, 1943. Iron and steel warehouses also were directed to accept no orders bearing ratings of less than AA-5, except A-1-k for alloy iron and steel for essential repair and maintenance up to 3 percent of quarterly quotas, as well as plate ends and short sheets; A-10 for tubular products and wire rope; and certain products sold primarily to farmers. Softwood lumber uses were further restricted.

WPB Adopts Controlled Materials Plan: Mine Priority Rating Lifted

(*Continued from page 59*)

One offshoot of the question of extending the work week was the possibility of a conflict between this permission and the President's executive order concerning overtime, containing a provision that the seventh day of work should be paid for at double. Late in November the Administration policy was clarified by a statement from the Labor Department that "Where different premium rates might apply to the same work, such as holiday rate and seventh-day rate, the order does not require pyramiding of the rates but payment of the higher rate."

After a preliminary meeting in New York, Oct. 28, representatives of the United Mine Workers and the anthracite operators agreed in principle on a six-day week for the hard-coal industry at Philadelphia Nov. 5. Putting the supplementary agreement into effect, however, was left contingent upon a higher price ceiling to permit paying the extra cost involved in time-and-one-half and rate-and-one-half work. This agreement is an extension of the provisions of the existing contract, which permits working six days a week for twelve weeks between Nov. 1 and April 30 at straight time up to 40 hours and time-and-one-half over 40 hours. It would permit the inauguration of overtime after 35 hours, with special consideration for men working more than 40 hours under the present agreement. The plan was further considered at a subcommittee meeting Nov. 19, in New York, but was referred back to the general committee for additional study, according to reports.

The first attempt to work a six-day week in the anthracite region, beginning Nov. 2, resulted, however, in refusal of miners at a number of collieries to report on Saturday, Nov. 7. Inauguration of the longer schedule followed action by the State Anthracite Quota Committee in lifting the industry quota to a point where a sixth day would have to be worked to meet it.

With activities in connection with a longer working week, operators also continued their efforts to find a solution to their general manpower problems. In Washington, meantime, it was announced that the War Manpower Commission was drafting a "national service act" for the control of manpower for introduction if thought necessary by the President. In November, also, the management-labor policy commission of the War Manpower Commission urged centralized control of all manpower problems, including transfer of the Selective Service System to the commission. Meanwhile, a subcommittee on manpower of the special Senate committee investigating the national defense program concluded that "The manpower problem is too difficult and complex to be solved by any simple solution such as creating a manpower czar or authorizing by statute a government agency to determine by coercion where each employee shall work." Lengthening the work week to 48 hours was among the other recommendations of the committee.

Developments in coal mining included adoption of a resolution by the Illinois Mining Institute requesting that steps be taken to halt the drain of manpower from its coal and fluorspar mining industries. Pointing out that men recently had been returned to the copper mines by the army and that the mining interests of Illinois are faced with the same problem, the resolution declared that "the director of Selective Service and Registration in the State of Illinois be advised of the critical situation existing in the personnel of the mining interests of this State and that, insofar as possible, the key men of our mining operations, mining engineers and students of mining engineering should be deferred from military service so that min-

ing production may be increased, rather than decreased, for the good of the entire nation." A copy of the resolution went to General Hershey, Selective Service Director, in Washington, D. C.

Late in October, Sterling S. Lanier, president, Norton Coal Co., Nortonville, Ky., petitioned the Kentucky Department of Industrial Relations for aid in obtaining relaxation of federal legislation to permit employing youths of 17 in the mines. William C. Burrow, commissioner, in turn suggested that Mr. Lanier direct his petition to Secretary of Labor Frances Perkins and Paul V. McNutt, chairman of the War Manpower Commission.

To assist industries, Washington authorities began plugging the "Manning Table" plan in November. Under this plan, industries are asked to prepare lists of key men, with information on the periods of training necessary in replacement, for submission to draft boards. This, it is claimed, should solve many of the troubles involved in operation of the Selective Service System. Booklets on the plan have been issued by the War Manpower Commission in cooperation with the Selective Service System.

Replacement Urged

Meanwhile, the War Department, in an announcement Nov. 10, reiterated in vigorous language the policy that employers should make provision now for replacement of workers subject to Selective Service. Every attempt should be made to secure men not subject to the draft, and full use should be made of all training agencies. Unless an employee is so essential that the company is prepared to appeal the case to the highest authority, no request for deferment should be made, the War Department contends, urging further that employers keep both local and State Selective Service authorities fully informed of their problems, including supplying local boards with complete information on the capabilities and duties of individual employees, availability of replacements and training necessary for new men in various jobs.

Canada, especially in the west, apparently was suffering no less than the United States. To alleviate a shortage growing out of reduced production on Vancouver Island, considerable coal was being diverted from Alberta mines, making the situation more critical in that province as well as in territory to the east which it normally serves. Developments in Alberta apparently uncovered a new reason for absenteeism—laying off to escape heavy war-time income taxes, this in the face of strenuous attempts to recruit new men, including farmers and hard-rock miners. Slow downs also were reported to be a factor in a few instances. Strikes were a further complication.

Strikes in the bituminous industry of the United States included one at the Edgewater (Ala.) mine of the Tennessee Coal, Iron & R. R. Co. over a change in man-trip starting times. On Nov. 3, a strike of 125 supervisors over the demotion of one of them closed three mines of the Rochester & Pittsburgh Coal Co., in western Pennsylvania. In the anthracite region, the Dorrance colliery of the

Mine Owner Traces Bad Bolt to Lair

The person who told this story is none other than [redacted], president of the [redacted], and head of the [redacted]. His veracity, in the market place is unquestioned. [redacted] time

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Tennessee Coal and Iron Co.
Cleveland-Cliffs Iron & Dock Co.
Tennessee Coal, Iron & R.R. Co.
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THIS newspaper story goes on to tell how the head of a coal producing company, when confronted with a bolt that had damaged a customer's stoker, left for the mine, tracked down the source of the offending metal and made good the stoker repair bill.

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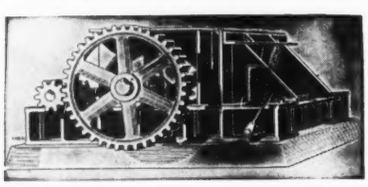

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Further—real protection is provided by improved Safety Toggle Equipment, which quickly passes Tramp Iron, and instantly returns Breakerplate to crushing position.

Seven (7) sizes afford a capacity range from 50 to 1000 tons per hour.

Send for Bulletin No. 2006.

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PUT YOUR COAL PREPARATION PROBLEMS UP TO US.

PENNSYLVANIA CRUSHER COMPANY

Liberty Trust Bldg. Philadelphia

Representatives in Principal Centers.

Lehigh Valley Coal Co. was closed Nov. 3 by a strike over rates. Contract miners, it was reported, claimed they were unable to make a day's pay because they now had to get along with only one laborer instead of two because of the manpower shortage. The stoppage ended Nov. 9 when the men returned to work pending further discussion of the alleged grievance.

•

Newly Formed Victory Coal Co. To Operate Penwell Mine

The newly formed Victory Coal Co., headed by Vernon Wells, of St. Louis, has leased and will operate the Penwell mine, Pana, Ill., according to Warren Penwell, president of the Penwell Coal Mining Co., owner of the mine. Robert White, Belleville, Ill., will be general manager and superintendent. The property will be operated on a royalty lease basis, with option to purchase at any time within five years.

Cleaning up started during the second week of November, with production scheduled to start as soon as possible. Cutting machines are to be installed for an estimated annual output of 200,000 tons. Loading will be by hand, with about 150 men employed.

The shaft was started in 1888 by the Penwell-Kitchell Coal Mining Co., and the first coal was hoisted in March, 1889.

•

Old Timer Goes to War

Feeling that the government's need for scrap held a higher priority than the sentiment naturally prevailing in such cases, Charles C. and William Whaley, of the Myers-Whaley Co., Knoxville, Tenn., have turned in their first mobile loading machine.

Development of the Myers-Whaley shoveling machine, the predecessor of the present shoveling machines and "Automat" loaders, started early in the present century, and after several years of experimental work a model was placed in the Wind Rock (Tenn.) mine of the Wind Rock Coal & Coke Co. to prove the shovel motion. It was followed by the first

Piled up ready to be hauled away, this old timer now goes to war.

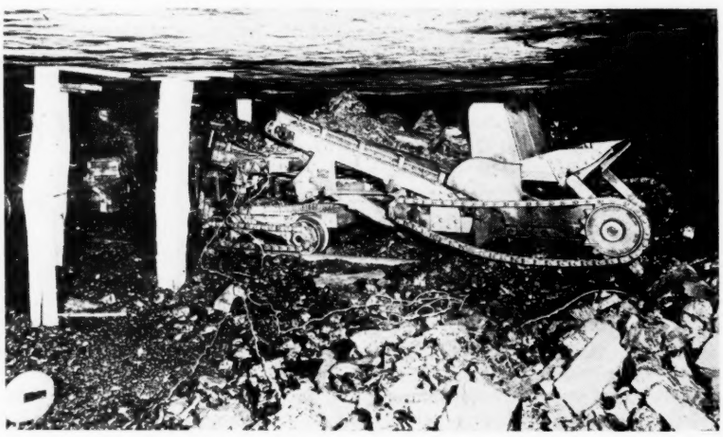
complete machine, which was taken out after several years and returned to the Myers-Whaley plant to take up its position as an honored memento of the organization's development work. Now it has gone to war. In Oct. 24, 1942, over 34 years later, it was loaded up as a start on its new job of slapping the Japs and otherwise discomfiting the enemies of the United States and its allies.

•

Association Activities

At its annual meeting, the New River Coal Operators' Association elected as president Gilbert Smith, general manager, Fire Creek Coal & Coke Co. Other officers named are: J. W. Garvey, vice-president; S. C. Higgins, secretary and traffic manager; P. M. Snyder, treasurer. The executive committee includes the above and Owen W. Cox, L. Ebersole Gaines, J. A. Hunt, James Martin, P. C. Thomas, R. H. Morris and S. A. Caperton.

Because of war conditions, the meeting was confined to a business session, with addresses by C. R. Stahl, Koppers Coal Division, Eastern Gas & Fuel Associates, on "Safety in Mining Under War-Time Accelerated Production"; L. Ebersole Gaines, president, West Virginia Coal Association, on "The Coal Industry and Its Part in War"; Jesse Redyard, Chief, West Virginia Department of Mines, on



On the job getting out the coal in 1908; now returning to service to lick the Axis.

"Activities of the Department of Mines, State of West Virginia." A watch and chain were presented to P. M. Snyder in appreciation of his services during the last 19 years as treasurer of the association.

Arthur B. Stewart has been elected president of the Georges Creek and Upper Potomac Coal Association; William L. Sherman, vice president, and G. O. Tarleton, secretary-treasurer.

Northern West Virginia Coal Association reelected William Findlay as president at its annual meeting in Fairmont. Samuel Pursglove was reelected vice president and T. E. Johnson, secretary-treasurer. The board of directors is composed of the foregoing and Messrs. Arkwright, Brackett, Christopher, Curtin, Doolittle, Forester, Hanna, Jamison, Jones, T. J. Johnson, McAndrews, Pero, Pryor, Reppert, Showalter, Stoetzer, Thomas and Workman. With attendance representing practically the entire tonnage of the field, the last year's work was reviewed and plans were formulated for future activities.

Anthracite Industries, Inc., on Nov. 17 elected the following officers: president, Frank W. Earnest Jr.; vice president, Myron R. Grover; vice president in charge of research, Dr. H. J. Rose; secretary and treasurer, John D. Jillson; assistant secretary and assistant treasurer, George W. Barnes. Directors named are: Robert L. Birtley, president, Hammond Coal Co.; Robert R. Bruce; W. M. Burrus, president, Penn Anthracite Collieries Co.; H. J. Connolly, president, Pennsylvania Coal Co.; G. C. Cooke, president, D., L. & W. Coal Co.; F. W. Earnest Jr., president, Anthracite Industries, Inc.; John C. Haddock, president, Haddock Mining Co.; F. W. Leamy, senior vice president, Hudson Coal Co.; Donald Markle, president, Jeddo-Highland Coal Co.; James H. Pierce, president, East Bear Ridge Collieries Co.; James Prendergast, president, Susquehanna Collieries Co.; R. E. Taggart, president, Philadelphia & Reading Coal & Iron Co.; James J. Tedesco, Pagnotti Coal Interests, Inc.; and J. B. Warriner, president, Lehigh Navigation Coal Co.

•

To Reverse Coal Traffic On Ohio River

Reversal of coal traffic via the Ohio River is being brought about by fruition of plans of the Jones & Laughlin Steel Corp. to transport southern West Virginia coal to the Pittsburgh area via the loading docks of the Island Creek Fuel & Transportation Co. and the Ohio River Co. at Huntington, W. Va. Plans called for movement of 35,000 tons of coal out of Huntington in November and from 40,000 to 50,000 tons in each succeeding month for an indefinite period.

First of the J. & L. boats to enter this trade were to leave Pittsburgh for Huntington Nov. 2. Heretofore river-borne coal has been towed downstream from mines in Pennsylvania and West Virginia to Cincinnati, Louisville and the South.

For smooth, quiet drives
The continuous wedging action of the De Laval worm gear transmits power without vibration, shock or noise. • Three or more teeth are always in contact, resulting in an even flow of torque and great strength. • Both motor and driven machine are saved the impact of gear or sprocket teeth. Frequently the product is improved or the machine can be speeded up because of the absolutely uniform motion. Operatives do more and better work when not annoyed by noise and vibration. Describe requirements and ask for Publication W-1129.
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De Laval worm gear driving picking tables and loading booms in Maiden Mine of the Kelly's Creek Colliery Co.
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MOSEBACH Flashweld
RAIL BONDS
KEEP VOLTAGE UP AT THE FACE—
INSURE MAXIMUM PRODUCTION,
and REDUCE POWER COSTS!
TYPE M8-F
• In these days coal production must be kept at a maximum, and from a profit standpoint, if you can't get the power you pay for at the face, you're wasting money every hour of production. It isn't the power you pay for at the face that counts, it's the power you get at the face. MOSEBACH FLASHWELD RAIL BONDS will protect you from power loss and will turn POWER into PROFITS. The patented Flashweld Process, gives greater welded strength, less resistance and longer Bond Life.
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1115 Arlington Avenue Pittsburgh, Pa.

Explosives and Haulage Are Meeting Themes Of Mining Section, Safety Council

(*Continued from page 89*)

rington, chief, Health and Safety Service, U. S. Bureau of Mines, Washington, D. C., stated that while there has been an increase in general industrial accident rates in the present year, variously estimated at from 18 to 25 percent, the coal-mining rate (tentative) for eight months is just about what it was in 1941, though in the metal mines he was afraid that accidents were increasing. The additional significance of this excellent coal-mine record for the first eight months of 1942 is realized when it is considered that an all-time low in fatalities was registered in 1941.

Bad Haulage Record—For the years 1931 to 1940, non-fatal injuries to underground haulage men in bituminous mines were 20.77 per million man-hours of exposure, declared W. W. Adams, supervising statistician, U. S. Bureau of Mines, Washington, D. C. The anthracite figure was 17.00, with iron mines only 3.89 and other metal mines in between. Further details are given in Fig. 1. Mr. Adams asserted that during those years the iron industry figures have ranged from 3.43 to 4.57 per million man-hours of exposure. Much the same relation holds in open-pit mines, with anthracite, however, having a less favorable record than bituminous coal.

Haulage Men Have More Than Their Share of Accidents—In 1941, said Harry Moses, president, H. C. Frick Coke Co., Pittsburgh, Pa., despite a gradual decrease over several years in the accident rate per million man-hours worked, transportation accidents at his mines constituted 24 percent of the total personal injuries sustained, though transportation embraced only 11 percent of the employees, while accidents attributed to falls of roof and sides constituted only 24.5 percent of the total with 100 percent of the employees exposed to the hazard.

Reducing Haulage Accidents

Slow diminution in the frequency of transportation accidents can be attributed to six major causes: (1) increased speed, (2) heavier equipment, (3) inadequate roadways and track, (4) neglect of these facilities, (5) poor design and maintenance of rolling stock and (6) increased length of hauls. The more common direct causes of such accidents are: (1) switching and spragging, (2) coupling and uncoupling cars, (3) falling over trips, (4) being run over by car or motor, (5) being caught between car and rib while not riding trip, (6) being caught between car and rib while riding trip, (7) being run over by runaway car or trip and (8) being injured when rerailing wrecked cars or motors.

Violations often responsible for such accidents are: (1) excessive speed, (2) flying switches, (3) jumping on or off moving trips, (4) pushing cars unnecessarily, (5) coupling and uncoupling moving cars, (6) coupling or uncoupling from inside of curves, (7) riding of trips by unauthorized persons, (8) riding of locomotives by unauthorized persons, (9) insufficient clearance, (10) lack of shelter holes, (11) backpoling, (12) nipping with cable in front of motorman, (13) loose clothing and (14) absence of signal lights on trips.

Avoiding Haulage Accidents—At intersections where main-line transportation is not slowed and long turnouts therefore are necessary, the legs of timber sets should be set on masonry sidewalls high enough and strong enough to protect the legs from contact with derailed mine cars. Accumulation of water in local dips contributes to costly wrecks and transportation delays and often is the cause of injuries, shocks and electrocutions. An effective system of drainage by gravity, where feasible, must be provided to keep all haulage roads as dry as possible because ineffective drainage is responsible largely for low and uneven joints, tracks out of line and scant clearance which results in transportation delays with all their incidental hazards to men engaged in this occupation and in dislodgment of roof supports. All ditches on clearance sides of headings should be substantially covered, and all pipelines should be placed below floor level so as not to cause transportation employees to fall.

Where it is necessary to shift from one side of the heading to the other, a well-lighted warning sign should be provided. The present trend, with the requirements of mechanical mining, is toward the automatic coupler, which undoubtedly will markedly reduce transportation accidents.

Equipment Changes Aid Safety—Added features which Mr. Moses believed have resulted in better and safer main haulage and gathering at his mines are: Full contactor control to keep power circuits out of locomotive cab, 32-volt 150-watt headlights and anti-friction motor and journal bearings. New haulage locomotives are being purchased with dynamic braking, air brakes and air sanders, all designed to increase safety.

In the development of explosion-tested gathering locomotives, attention has been given to the design for safety and maintenance. Constant pressure by the purchasers has resulted in development of smaller controllers of contactor type, greatly increasing the free space in the cab. It also has resulted, for low-type units (26 in. over rail), in a "safety deck" on the front end, where brakeman can ride without risk. In addition, vulcanizers have been widely adopted for safer repair of trailing cables.

Balanced Operation Important

Avoiding Dangerous Haste—One of the most important steps in preventing underground haulage accidents is a planned system in which the gathering, secondary and main-line operations are equally balanced. If intelligently done and transportation service is properly organized and controlled, a major problem will have been solved since a steady flow of mine cars to and from the tipple and the working faces will be assured. This will, to a great degree, eliminate the undue haste inevitable with gathering service where main-line distribution is irregular. Double track or an adequate number of passing tracks should be provided along main-haulage roads to keep trips moving without excessive haste. On secondary haulage, empty and loaded tracks with the necessary capacities should be provided reasonable close to the working faces.

Dispatching Aids Safety—At one of the large operations of the company, safety and economy have dictated installing an elaborate system of dispatching that requires each gathering motorman, when bringing loads from, or taking empties to, the working faces, to telephone the dispatcher when he arrives at the sidetrack, giving number of loads "pulled off" and the number of empties he wishes to take. Flat-road or tram locomotive operatives follow the same procedure. On a control sheet in his office, the dispatcher not only records the number of loads brought to, and empties taken from, all sidetracks but he also records the time of arrival and departure of all locomotives from their respective sidetracks. This method of haulage control has been found to be very effective.

Are Haulage Men Competent?—Though a miner must have a certificate, a transportation employee does not have to be so qualified, declared C. C. Brehm, supervisor of safety and compensation, Susquehanna Collieries Co., Nanticoke, Pa. Yet in most anthracite mines, haulage accidents usually run a close second. Too much coal often is mined while gangways are advancing and sometimes even the pillars are removed concurrently with

SAFETY LEADERS

Officers to guide the counsels of the Mining Section of the National Safety Council were chosen as follows at the National Safety Congress:

General Chairman — John Treweek, safety engineer, Homestake Mining Co., Lead, S. D.

Vice Chairmen—M. L. Coulter, safety engineer, Clearfield Bituminous Coal Corp., Indiana, Pa.; C. M. Fellman, safety engineer, Montreal (Wis.) Mining Co.; C. E. McKnight, safety director, Lake Shore Mining, Ltd., Kirkland Lake, Ont.

Secretary and News-Letter Editor —Dan Harrington, chief, Health and Safety Service, U. S. Bureau of Mines, Washington, D. C.

Committee Chairmen — Entertainment, John T. Ryan Jr., Mine Safety Appliances Co., Pittsburgh, Pa.; membership, Cadwallader Evans Jr., vice president and general manager, Hudson Coal Co., Scranton, Pa.; program, J. J. Forbes, chief Mineral Production Security Division, U. S. Bureau of Mines, Washington, D. C.

gangway extension. In most cases, this results in heaving, misaligned track, broken timbers and loss of clearance, a condition difficult to correct and one which increases cost and sets the stage for an injury, which usually occurs.

Among bad practices Mr. Brehm stressed pushing cars by locomotives, which he said was a habit more than a necessity and could be eliminated in large measure if a serious effort were made. Backpoling also causes serious accidents because the trolley will jump off the wire and may displace timbers, bringing them and the loose material above them down on the motorman and brakeman. The pole, also, may break and strike them. Flying switches obviously is a bad practice. Something is wrong with any haulage system where such a practice is necessary through doors or switches. No one, not even the brakeman, should be allowed to get on or off a moving locomotive or trip, for a misstep or a slip may cause a serious, if not a fatal, accident. Other bad practices are coupling or uncoupling moving cars, coupling or uncoupling on the tight side of a curve, riding between cars, inadequate blocking of cars at face, obstructed clearance and crossing between cars.

Those Dangerous Words—"All right" has sounded the death knell for many a man. In anthracite, the miner prepares and fires his own shots. A miner and his laborer were working in a pitching breast some distance above the gangway, on which latter they had their firing station. They prepared a shot and descended to the gangway to fire it. The shot failed and, suspecting a broken firing line, the laborer started up the pitch to find the break. A few minutes later, the laborer called back "I find him all right," but the miner heard only the words "all right" and, thinking his buddy was in the clear, fired the shot and the laborer was killed. Many other accidents have occurred through misunderstanding the meaning of "all right." It is recommended that a whistle or light code be used for signaling.

"Our rule No. 17," said Mr. Brehm, "is one on which we lay much stress. It reads: 'At all times when a haulage locomotive is stopped, a gong or alarm must be sounded before the motor is again started'." Small glass panels are provided in ventilating doors so that approaching trips may be seen. Motormen must sound gong or alarm when approaching bends, crossings, corners and all other hazardous places. Retrackers must not be held in place by hands or feet. Locomotives must not be operated when the motorman is not in place. Bumper guards of proper design must be maintained on all haulage motors. When a miner, laborer or other workman is asked about some unsafe practice, he usually admits he has been properly instructed by his immediate supervisor, but it is not unusual for a transportation worker to reply: "Nobody ever told me," which fact shows that such employees are not instructed adequately.

If Shuttle Cars Are to Be Installed—When an operating company begins to experiment at one of its plants with equipment hitherto not used, the best men available usually are employed to make the machine perform productively and safely, declared E. J. Weimer, Federal division superintendent, Koppers Coal Division, Eastern Gas & Fuel Associates. If the new equipment has had the "bugs" worked out of it, it usually measures up to the theoretical expectation, but it is the expansion period when subsequent units are installed and when less capable and less enthusiastic men and foremen are handling the equipment that heavy production losses, personal injuries and even mine disasters are suffered.

If the plant utilizing this new equipment passes through these first two stages successfully, the problem of mechanical maintenance is faced, and this is a problem that lasts as long as the equipment and presents many safety as well as production problems that probably were not much considered prior to the installation of the first unit.

Wider Roadways, Heavier Crossbars—As shuttle cars are wider than the mine car used in the former hand-loading work, longer crossbars are needed, and these necessarily weigh more. Shuttle cars, also, are not rigidly confined to an exact roadway, so additional space must be provided between crossbar supports. Coal on the conveyor is likely to strike these heavier crossbars and may knock them out. Use of battery-driven rubber-tired shuttle cars eliminates a rubber-covered locomotive cable and may decrease the likelihood of damage to loading-machine cables, as compared to having them run over by locomotives or cars.

Rock Dust Prevents Explosions

By application of rock dust, explosion hazards from coal-dust accumulation can be as effectively reduced in shuttle-car as in regular locomotive haulage, but to do this mechanically involves a costly investment in a rock duster for each unit or a heavy cost for the transfer of rock-dusting equipment from one shuttle car unit to another. At present, the Federal division obtains good results by spreading the dust by hand over roof, ribs and floor.

Planning More Necessary—In hand-loading, projection always has been essential for successful mining, but, because of the slowness of advance and retreat with this method, errors in projection could be corrected promptly enough to prevent any serious loss in production or extensive mining hazard. With mobile loading, and more recently with shuttle-car haulage, the increase in concentration and speed of extraction makes long-range planning and accurate projection more essential than ever. Battery-charging units, track-haulage loading points, material stock yards, power lines and keeping stationary electrical equipment on intake air, etc., have to be planned in minute detail.

Proper Maintenance—Except failure to control the roof, said Mr. Weimer in the light of his experience, nothing is responsible for more personal injuries than makeshift maintenance. If water is present, muddy travelways create several hazards. The electrical controls of standard shuttle cars are called "footswitches" and are mounted and act much as accelerators on automobiles. In driving through water or wet clay, the switch may develop short circuits or get so clogged with mud that it may not function in stopping and the car will collide with posts, persons or equipment. Operators have been pinned between the shuttle car and a rib or post and severely injured or even killed. Such accidents have occurred because of electrical defects or improper maintenance,

"You win, Murdock; he doesn't even register on these scales."

when haulage-ways were dry and clean, but the possibility is greatly accentuated by muddy roadways.

Shuttle-car brakes are similar to automobile brakes and are operated by a foot pedal and hand level. In driving, the foot pedal is used and if the brake bands and drums become wet, the operator may not be able to stop the car where and when he desires, thus creating a somewhat greater hazard than in driving an automobile without brakes. There is danger also of skidding on slippery roadways.

Pumping, Supplies and Post-Pulling—Unless water is removed as working faces advance, the mud may be so thick the water cannot be pumped. Some mines accordingly corduroy with wood slabs or bridge the worst mud holes. Others even hard-surface their permanent shuttle-car roadways with concrete.

Using Shuttle Cars Safely

It is natural for an operator delivering supplies to discharge his load with the conveyor. This frequently results in fouling a post or crossbar between the conveyor flights and on the ribs or bottom irregularities. When the post breaks loose or the conveyor chain snaps, the post may strike a workman. When shuttle cars are used to pull posts, the operator is likely to watch the pull rope and pay no attention to the travel of the car, which may collide with other equipment or the rib. Operators therefore are required to face in the direction of travel when the car is in motion. Locomotives can be heard when they approach a door or curtain, but shuttle cars are relatively silent. Therefore, they must be provided with bells or horns, which they should sound at intersections and also wherever a view of the haulage road is obstructed by brattice cloth or ventilating doors. When a cutting or loading machine is working near a shuttle car, the danger is greatly increased.

Explosives Regulation—Because of the passing May 7, 1941, of the act providing for federal coal mine inspection and the putting in operation of the Federal Explosives Act of Oct. 6, 1917, on Dec. 8, 1941 (revised Dec. 26), as a result of the declaration of war against Japan, together with the passage of an act authorizing establishment of an organization in the Department of the Interior for making examinations and reports to prevent loss of production in the mineral industries, the force of the U. S. Bureau of Mines Health and Safety Service in the field has been expanded from less than 70 to 325 men, said Mr. Harrington in analyzing explosives regulation.

Fifty men have been sent into the field to explore matters pertaining to explosives; to license the manufacture, sale, storage and use of explosives; and to make and enforce regulations on the issuance, storage and use, and to some extent the transportation of explosives, such regulations covering explosives to be used for non-mining purposes as well as for mining. There are more than 200,000 explosives licensees and at least 30,000 storage magazines, perhaps 100,000. Many examples of careless storage have been found. In fact, about two-thirds of the explosives storehouses in the United States should be condemned as unsafe and insecure against pillage and stray or intentional shots as well as against accidental firing.

Ultimately, it may be necessary to search men for explosives as they leave the mines, inasmuch as the military authorities are becoming insistent that definite knowledge be obtained as to the disposition of all explosives.

Many storehouses do not comply with the "American Table of Distances" and in some cases, where population is dense, compliance unquestionably is difficult. The Federal Explosives Act is interpreted as having prevention of theft of explosives for possible sabotage use as its objective, with safety of the user as incidental rather than fundamental. The "Instructions on Storage and Use" issued in connection with the act are by no means as rigid as are the regulations, the latter having the force of law while the field personnel of the Bureau of Mines have some leeway in connection with the application of the "Instructions on Storage and Use."

Had the operator the right to search his employees for explosives? asked Mr. Haselton, to which Mr. Harrington replied that they could be given that right by the Bureau of Mines under the law which empowers that body to issue all necessary regulations. Moreover, men already are being searched at mines for matches and smoking materials. The Calumet & Hecla, said Jacob L. Alt, safety engineer, Calumet, Mich., has fingerprinted all its employees, as have most of the mine owners in the Lake Superior district. Though in Canada, declared Angus Campbell, manager, Omega Gold Mines, Ltd., Larder Lake, Ont., Canada, the companies are not compelled to search for explosives, his company has done so at irregular intervals for three years.

Good Cooperation Received

Mr. Harrington spoke highly of the cooperation received from explosives manufacturers in matters pertaining to the administration of the Federal Explosives Act. He also called attention to the fact that the Bureau of Mines, under an act passed in April, 1942, had placed in the field 76 engineers (45 in metal and 31 in coal mining) to inspect and report on mining properties to promote uninterrupted operation and forestall any condition that might decrease production. He emphasized the fact that this new wartime field organization of the Health and Safety Service of the Bureau of Mines is designed to be helpful in the mining industry and asked for full cooperation that the purposes of the activity may be realized.

Means of identification of stray blasting caps, when found, have been arranged by one coal company with the help of the explosives manufacturers, said Mr. Currie. By sealing a numbered paper slip inside the shell of each blasting cap and placing the same number on the outside of each carton of 100 caps, the purchaser of the carton can be identified. Stray caps can be sent to the manufacturer to open, thus revealing the number.

Oil and Gas Use Curtailed Still More; Stove Production Boosted by WPB

FURTHER steps toward curtailment of oil and gas use in the eastern region of the United States marked developments in the fuel situation in November, along with additional attempts by government authorities to force conversion to coal wherever possible. Meanwhile, deliveries of pipe for the eastern extension of the 24-in. Texas-Illinois oil line were begun. This extension will require 219,000 tons of steel and will deliver, it is stated, 300,000 bbl. of crude oil daily to the eastern seaboard.

A sudden, sharp increase in demands for petroleum products as a result of the African campaign and the failure of tank-car shipments to deliver the hoped-for quantities were stated to be responsible for a decision by the War Production Board to further restrict use of petroleum products in 17 eastern states. One upshot was a cut in the value of gasoline rationing coupons from 4 to 3 gal. The total cut for all petroleum products was set at 11 percent by Secretary of the Interior Ickes in an announcement Nov. 12. Every effort, it also was stated, would be made to avoid further reductions in rations for home heating, but at the same time it was announced that a tougher attitude would be adopted on the subject of conversion.

Dissatisfaction was expressed with both industrial and domestic conversion progress. Against the announced goal of 40,000,000 bbl. annually set up for industrial applications, only some 27,270,157 bbl. had been achieved in the eastern states. For the East, Middle West and Southwest, the total up to Nov. 21 was announced as 32,367,000 bbl. Another 7,683,885 bbl. will be saved when conversions now under way are completed.

In addition to industrial, domestic conversions in the East have resulted in savings of 4,203,750 bbl. annually. This, however, is stated to be only a small part of the total possible. Consequently, among other things, instructions were issued Nov. 13 that apartments, office buildings, institutions and similar structures would be regarded as convertible unless adequate proof to the contrary is furnished, and that delivery of oil rations to convertible structures would be terminated about Jan. 20. Reports also indicated that temperatures would be sharply cut in theaters and similar public gathering places.

Following a request early in the month that the public economize on the use of gas, the War Production Board on Nov. 13 tightened control over the delivery of natural and manufactured gas by revising Limitation Orders L-31 and L-274. In the case of L-31 (natural and mixed gas) restrictions on deliveries of natural gas to

new customers were made nation-wide, with Nov. 30 as the deadline (except for previous deadlines in the case of non-residential consumers) for the installation of new equipment and delivery of gas for both residential and non-residential users. L-174 was modified to make it conform closely to the new provisions of the natural gas order.

While the manufacture and assembly of small stokers (up to 61 lb. of coal per hour) was stopped completely on Sept. 30 and the sale of commercial and industrial types is subject to priority regulations, a number of measures were adopted in November to promote coal use. Steps were taken to ease the process of securing industrial strokers for conversion, among other things, and manufacture of coal and wood-burning cooking stoves was prohibited Nov. 10 until Jan. 1 to release material for the manufacture of coal and wood heating stoves.

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Christopher to Reopen Four States Mine

Preparations for reopening the old Four States mine, at Four States, Marion County, West Virginia, began on Nov. 18, when the boilers were fired and renovation of the property was started. Idle for more than eleven years, the property has been acquired by Brock, Inc., a division of Christopher Associates, which purchased the Four States company for $250,000.

To be operated under the name of Christopher No. 6, the property consists of 4,000 acres of unmined coal and about 600 acres of surface land. There are 180 dwellings on the property as well as mining structures and equipment. Christopher representatives said the mine will employ 450 to 500 men and that it was expected that production of 60,000 tons of coal per month would be reached within four months.

Priorities have been obtained, it was said, which will permit purchase of much extra equipment plus standard-gage tracks for use in the mine. Preparations for resumption are under the direction of Alex C. Beeson, general superintendent for the old Four States company.

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Film Depicts Anthracite As "Fighting Fuel"

A motion-picture "short" filmed in the hard-coal region of Pennsylvania and being currently shown on screens in regional cities is called "Anthracite, the Fighting Fuel." Production of the picture by the Anthracite War Production Committee is cited in the local press as a signal achievement in dramatizing anthracite's vital and essential function in America's war effort. Fast-moving scenes of collieries in operation have been woven in skillfully with shots of actual war maneuvers taken by war news photographers. Scenes show how anthracite miners support men on the battle front and reveal the importance of hard-coal production. The scenes are described and explained by a commentator.

Charles A. Schindler gets institute award

West Virginia Institute Honors Schindler

Winner of the 1942 award of the West Virginia Coal Mining Institute, Charles A. Schindler 3d, Mahan, W. Va., was graduated in June with the degree of Bachelor of Science, and is now in the Army. While attending school he was president of Sigma Gamma Epsilon, treasurer of Tau Kappa Epsilon, a social fraternity, and a member of the student chapter, American Institute of Mining and Metallurgical Engineers. His aunt is president and treasurer, Christian Colliery Co., Mahan. The award is made available each year to the high ranking senior in the coal-mining option of the School of Mines at West Virginia University.

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Simplified Wire-Rope Practice Under Consideration

A proposed simplified practice recommendation for wire rope has been submitted to producers, distributors, users and others interested for approval or comment, according to the Division of Simplified Practice, National Bureau of Standards. This recommendation, which includes sizes, constructions, grades and breaking strengths of the vast majority of tonnage of wire rope, is based on an exhaustive analytical review of existing published standards of the industry. The recommendation is designed to conserve strategic materials and available productive capacity for the war program and at the same time adequately care for important consumer requirements.

General adherence to the 20 tables shown in this recommendation will result in a net reduction in variety from 973 items to 643, or 33.9 percent. The major production and use of wire rope, and therefore the predominant tonnage, is covered by four different rope constructions, while the reduction in variety is from 352 items to 182, or 48 percent.

The proposed recommendation was developed by the contact committee of the Wire Rope and Strand Manufacturers' Association and submitted for passage through the regular procedure of the Division of Simplified Practice, National Bureau of Standards, at the request of the Wire and Wire Products Section, Iron and Steel Branch, War Production Board.

Distributors and users of wire rope desirous of aiding the war program by conforming with this important conservation measure are invited to write to the Division of Simplified Practice, National Bureau of Standards, Washington, D. C., for mimeographed copies of the proposed simplified practice recommendation.

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To Survey Utah Coal Resources

Two professors in the geological department of the University of Utah, Salt Lake City, Drs. F. F. Hintz and G. C. Selfridge, have started on an extended survey of the State's coal and iron resources. It is said that the survey has been undertaken because of the wide variation in estimates concerning the tonnage of coal and iron available there. The geologists are to be away about three months. It was stated that if sufficient coal and iron deposits are discovered, the Kaiser interests may transfer production to Utah.

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Origin of First-Aid Training Told by Hudson Men

The origin of first-aid training, at Jermyn colliery, Hudson Coal Co., Jermyn, Pa., to which attention has recently been drawn by the nationwide expansion of such training in connection with the war effort, is recounted in the *Safety Commentator* of the Hudson Coal Co., from a report made by a research committee consisting of David Jenkins, Edward Stuart and William Whitley to Edison Thomas, chairman of the Jermyn First Aid Memorial Committee. Messrs. Jenkins, Stuart and Whitley are surviving members of the original organization. The report is as follows:

"In the fall of 1899, when the original first-aid class was organized, Jermyn colliery was divided into Jermyn No. 1 and Jermyn No. 2. The present mine was the old No. 1, No. 2 being located to the eastward. The mine employees were principally English, Welsh, Scotch and Irish, many of whom had used and heard of first aid while employed at mines in their native British Isles, some had been trained by the St. John's Ambulance Society.

"Accidents were numerous and severe with no way of helping an injured person other than with handkerchiefs, coat linings, shirts, or clothing taken from the persons of the workers to form bandages; the application of chewing tobacco to open wounds to stop bleeding and of lamp oil to relieve burns. After this the injured were removed to the surface, where they were treated by a doctor. Most of the injured were then removed to their homes, but severe cases were taken to the Carbondale Hospital in a horse-drawn ambulance, a long and painful trip.

"Attending most of the mine accident cases at that time was Dr. Mathew J.

Shields, who had his home and office on ground now occupied by the First National Bank of Jermyn. Dr. Shields opened his office there in 1889, a year after he graduated from Bellevue Hospital Medical College in New York City. He was a native of Crawfordville, Warren County, Georgia, and had moved to Carbondale in 1881 to settle with his brother, Dr. S. S. Shields, who was practicing medicine there.

"There was no compensation to those injured and, with few exceptions, the expense of treatment and loss of wages had to be borne by the injured employee, so of course mine accidents and the treatment of the injured were a matter of even graver concern and discussion to the workers than at present.

"From such discussions on the street, Dr. Shields, no doubt, learned of the first aid work in England. An unverified story tells that one day while engaged in a discussion at the store in Edgerton Patch, a mining settlement now abandoned, word was brought to him of an accident at Jermyn No. 1. Instead of waiting for the victim to be brought to the surface, Dr. Shields entered the mine himself as rapidly as possible and administered first aid at the scene of the accident, splintering a broken leg. The fact that this leg healed three weeks sooner than similar injuries treated in the customary manner convinced Dr. Shields of the value of prompt attention to wounds and he assembled the first industrial first-aid class in the United States in the Carpenters Hall of the Farmers Hotel at the corner of Main and Rushbrook Sts. (now the Windsor Hotel) on October 25, 1899.

"There is still some discussion as to the role of Dr. Shields in forming this class, but to the best of our recollection the honor belongs equally to the charter members and to Dr. Shields and we have no desire to detract from the efforts of either.

"The original class was composed of 25 members, including William Tennis, the first president; Harry Langman, secretary; John Hogarth, treasurer; and George Pendered Sr., William Westington Sr., William J. Toman, Thomas (Drummer) Williams, John Culey, Andrew Richards, Steven Morcom, Joel Morcom, William Whitley, William Roberts, Fred Dawe, James O'Dowd, William Mellow, Peter Kelly, Samuel Waters, Joseph Beckwith, Thomas Harvey, Edward Stuart, David Jenkins, James Langman, Thomas Warrick, and one other whom we have not been able to find. Ten of these are still living on this date (June 1, 1942).

First-Aid Book Compiled

"After organization, meetings were held at Carpenters Hall every Friday evening at 7:30 p.m. Officers served for six months and dues were 25 cents per month. Our first books were physiology textbooks borrowed from the Jermyn Public Schools. These were used until first aid handbooks, published by the St. John's Ambulance Society in England, were ordered and received. When these books arrived and were studied, it was considered by Dr. Shields and the leading members of the class that they were not entirely applicable to work and conditions in the United States, so a new 'First Aid Handbook' was compiled by the doctor and printed by Thomas Boundy, a Jermyn printer much interested in the work.

"This was the first handbook on this subject by an American. A second edition was published in 1907. Both of these editions contained accident 'Don'ts' by Dr. H. C. Wheeler, of Carbondale, and are the progenitors of our present-day Red Cross and Bureau of Mines first aid manuals, and the contents of which contain much that is little changed from the original handbook of Dr. Shields.

"Our class work consisted of lectures by Dr. Shields and of practice in applying the bandages, etc. Our subject was always Thomas (Drummer) Williams, who usually completely divested himself of his clothing so that we could approximate actual conditions of first-aid work as nearly as possible. It was the custom of Dr. Shields to bring a skeleton to demonstrate anatomy, and once, we recall, a fresh beef heart was brought in to explain heart action, which caused a few of our members to faint dead away.

"The beef heart was brought in, we recall, by the late Dr. Byron H. Jackson, then of Mayfield but later an eminent Roentgenologist, who with Dr. John S.

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Niles Sr. and a Dr. Jenkins, who had seen service in the Spanish-American War, were among the local doctors who at times were lecturers to our class.

"Bandages for the classes were made at the homes of the members and the first splints were made by carpenters at Jermyn colliery. Money for these and other supplies was raised by requesting the sum of 5 cents each payday from the workers at Jermyn mine, and their response was always generous. They realized the value of our work and we always had money to carry it on.

"So much for the classwork. Applying our work to the mines and in fact to everyday life, each member carried a first-aid packet both at work and away from it. We had boxes built at the colliery and placed throughout the mines. These boxes were nailed conveniently on props and contained tourniquets, bandages, splints, spirits of ammonia, first-aid packs and carron oil for burns. Four stretchers were also placed at strategic spots. Each member carried a key to the boxes, but if no member was near at the time of an accident, they were hurriedly opened. In the meantime a first-aid man was sent for.

"The work and classes were faithfully carried on until 1904, when a disastrous fire destroyed Dr. Shields' home and office. Dr. Jackson succeeded him and the classes continued until 1906, when, due to severe weather causing poor attendance, the class was disbanded. About $50.00 remaining in the treasury and the equipment used by the classes was given to the Emergency Hospital of Carbondale, now the Carbondale General Hospital. Dr. Shields removed to Scranton, where in 1905 he was engaged by the late Captain W. A. May, general manager of the Penna. & Hillside Coal & Iron Co., to organize first-aid classes at the various collieries of that company. This company held a first-aid meet at the Scranton Armory on November 24, 1906, the first first-aid meet held in America.

"This, to the best of our memory and research, is a faithful account of the beginning of industrial first aid in the United States."

•

Coal-Mine Accident Fatality Rate Shows Further Decline

Accidents at coal mines of the United States caused the deaths of 89 bituminous and 6 anthracite miners in September last, according to reports furnished the U. S. Bureau of Mines by State inspectors.

With a production of 48,760,000 net tons, the accident death rate among bituminous miners was 1.83 per million tons mined, compared with 2.28 in September, 1941.

The anthracite fatality rate from accidents in September last was 2.95, based on an output of 5,418,000 tons, against 3.50 in the ninth month of 1941.

For the two industries combined, the accident fatality rate in September last was 1.94, compared with 2.40 in the corresponding month of last year.

Fatalities during September last, by causes and states, as well as comparable rates for the first nine months of 1941 and 1942, were as follows:

DEATHS AND FATALITY RATES AT U. S. COAL MINES, BY CAUSES OF ACCIDENTS*

January–September, 1941 and 1942

	Bituminous				Anthracite				Total			
	Number Killed		Killed per Million Tons		Number Killed		Killed per Million Tons		Number Killed		Killed per Million Tons	
	1941	1942	1941	1942	1941	1942	1941	1942	1941	1942	1941	1942
Underground:												
Falls of roof and coal	422	432	1.166	1.007	87	104	2.121	2.289	509	536	1.264	1.130
Haulage	140	167	.387	.389	22	27	.536	.594	162	194	.402	.409
Gas or dust explosions:												
Local	15	8	.041	.019	6	5	.146	.110	21	13	.052	.027
Major	43	121	.119	.282	...	...	.....	.....	43	121	.107	.255
Explosives	19	14	.053	.033	13	10	.317	.220	32	24	.079	.050
Electricity	29	39	.080	.091	4	4	.097	.088	33	43	.082	.091
Machinery	23	31	.064	.072	...	1	.....	.022	23	32	.057	.067
Shaft	3	4	.008	.009	2	2	.049	.044	5	6	.012	.013
Miscellaneous	10	26	.028	.060	10	9	.244	.198	20	35	.050	.074
Stripping or open-cut	15	16	.041	.037	3	2	.073	.044	18	18	.045	.038
Surface	37	35	.103	.082	12	9	.293	.198	49	44	.121	.093
Grand total	756	893	2.090	2.081	159	173	3.876	3.807	915	1,066	2.271	2.247

* All figures subject to revision.

U. S. COAL-MINE FATALITIES IN SEPTEMBER, 1942, BY CAUSES AND STATES

	Underground												
State	Falls of Roof	Falls of Face	Haulage	Gas or Dust Explosions	Explosives	Electricity	Machinery	Other Causes	Total Underground	Shaft	Open-cut	Surface	Grand total
Alabama	4	1	..	..	1	..	..	..	6	..	..	..	6
Arkansas	..	..	..	2	..	..	..	..	2	..	..	..	2
Colorado	..	..	..	..	..	..	..	1	1	..	..	..	1
Illinois	3	..	1	..	..	..	..	..	4	1	1	..	6
Indiana	1	..	2	..	..	..	..	..	3	..	..	..	3
Iowa	1	..	..	..	..	..	..	..	1	..	..	..	1
Kentucky	7	..	7	..	..	1	..	..	15	..	..	..	15
North Dakota	..	..	..	..	..	..	..	3	3	..	..	..	3
Ohio	..	..	1	..	1	..	..	..	2	..	..	..	2
Penna. (bit.)	15	..	3	..	..	1	..	..	19	..	..	..	19
Tennessee	3	..	..	..	..	..	..	..	3	..	..	..	3
Utah	..	1	1	..	..	..	..	..	2	..	..	..	2
Virginia	1	..	..	..	..	..	..	..	1	..	..	..	1
West Virginia	10	..	7	..	..	2	3	..	22	..	..	2	24
Wyoming	..	..	1	..	..	..	..	..	1	..	..	..	1
Total bituminous	45	2	23	2	2	4	3	4	85	1	1	2	89
Pennsylvania anthracite	9	..	4	..	1	..	..	..	14	..	..	2	16
Grand total	54	2	27	2	3	4	3	4	99	1	1	4	105

QUALITY MARLO PACKING

METALLIC & SEMI-METALLIC

PACKING

for

MINE PUMPS

"The Packing that gets the Repeat Orders"

For deep mine pumps. Resists acid mine waters. Keeps grit out of stuffing box. Three types.

• MARLO ALL PURPOSE METALLIC PACKING

Best ever devised. Will not freeze at 70° below. Soft, pliant, like fibrous types, yet easier to handle. Won't cut, score or corrode moving parts.

• "TWIN-TWIST" SEMI-METALLIC PACKING

Metal strands twisted with asbestos. Anti-frictional. Durable. Economical. Remarkable compressability. Never hardens. For temperature up to 550° F.

• "RED WATER" SEMI-METALLIC PACKING

Most modern development for all hydraulic applications. A solid-packing vegetable fibre combined with metal strands. Retains form under any conditions.

Let us serve you!

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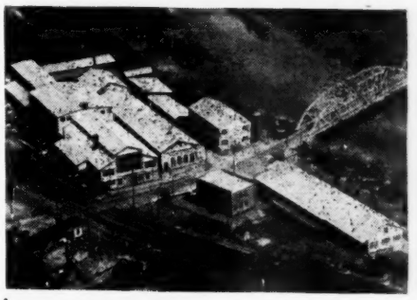

The Wilmot Foundry and Shops Are **PREPARED** *to Help You*

Maintain Maximum Wartime Efficiency of Anthracite Coal Cleaning Equipment

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Offices: Hazleton, Pa. : : *Works:* White Haven, Pa.

WILMOT

A GREAT NAME IN THE COAL INDUSTRY

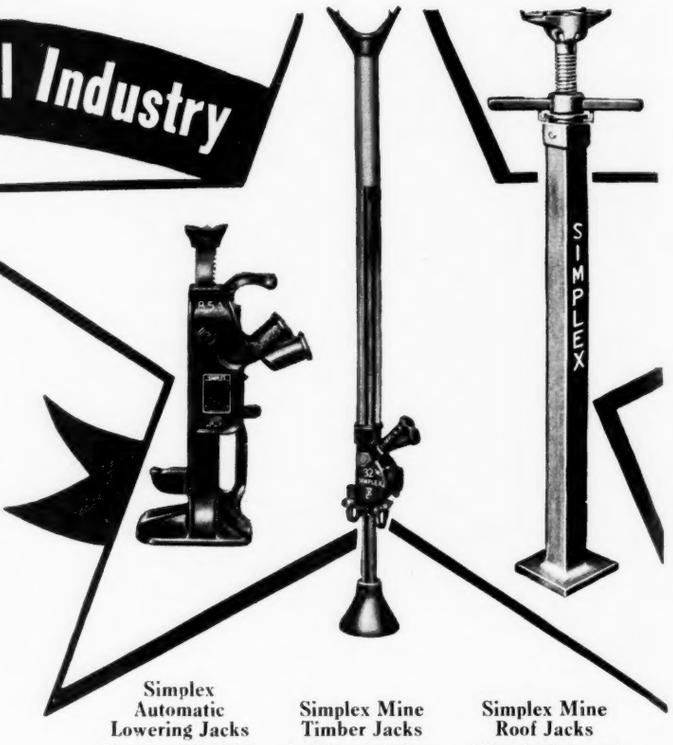
HYDROTATOR COAL Preparation UNITS

It's up to the Solid Fuel Industry

The coal mining industry has a man-size job on its hands—supplying fuel for an increasing number of homes where oil or gas has been curtailed or denied altogether, getting more coal to generating plants, ship and locomotive boilers, gas plants, producing fuel for heat treating and melting—and, in the case of captive mines—getting more coal to coking ovens and "soaking" processes.

Mine safety is more important than ever before. The drain on manpower makes every miner a key man. Every reasonable precaution must be taken to keep them on the job to speed up production and eliminate tie-ups.

Simplex Mine Jacks are "ready, willing and able" to help safeguard life and property and to boost production. Bulletin "Mines-42" tells the whole story.



Templeton, Kenly & Co.

Better, Safer Mine Jacks Since 1899

Chicago, Ill. California, Pa. Princeton, W. Va.

Simplex
LEVER - SCREW - HYDRAULIC
Jacks

Simplex Automatic Lowering Jacks

Three models—84-A for thin, 85-A for medium and 86-A for thick seams—all 5-tons capacity. Gold Medal Award for Safety lifting mechanism. Prevent sprained backs in moving conveyors, rerailing cars, etc.

Simplex Mine Timber Jacks

Jack heavy timbers into place faster, safer. Screw type for economy—lever type for speed. Latter (shown) also used for safe prop pulling, removing slack in power cables, straightening bent mine cars, etc.

Simplex Mine Roof Jacks

Allow loaders and conveyors to work in less space. Put up faster. For use with beams, rails or timbers, 8 and 16-tons capacity. Sizes for all seams. Men and equipment at working face are better protected.

Coal may now offer an Unbeatable Combination

Availability and Economy

PLUS *Cleanliness*

Coal in its *natural state* offers every advantage the public desires *except cleanliness*. Dirt is the old bugaboo that forced so many users to convert to other fuels.

Build public preference for coal by dustproofing it with DOWFLAKE* Calcium Chloride. Hold this peak war-time volume and avoid a repetition of mass conversions to oil and gas after the war.

DOWFLAKE is easy to apply—it's colorless, odorless and economical.

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MIDLAND, MICHIGAN

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*Trade Mark Reg. U. S. Pat. Off.

Dowflake CALCIUM CHLORIDE 77-80% { FOR DUSTLESS COAL

R AND S COMPANY *Equipment* FOR YOUR PARTICULAR JOB..

THERE is no other coal cleaning job exactly like yours.

R and S understands this and is prepared to recommend equipment that specifically meets your problem.

The following bulletins that outline some R and S equipment are available.

Write for them today

HYDRO-SEPARATOR
No. 156—FOR COARSE COAL
HYDROTATOR
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STUMP CLEANER
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There is no obligation

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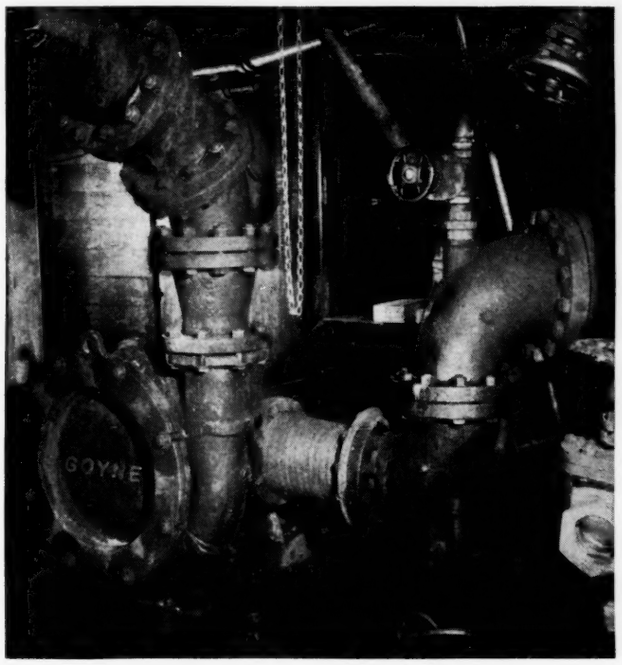
GOYNE PROCESS PUMPS



A Sand Pump is only a link in a chain in a coal washing plant, but it can be a strong link if it embodies the following features as does the Goyne:

1. Ease of inspection of all wearing parts. All internal portions are immediately accessible after removing only the rear head of the pump. No suction or discharge piping is disturbed.

2. The one packing box of the pump is subjected only to suction pressure and is readily kept clean by a low pressure clear water line. Long packing and shaft sleeve life is assured.

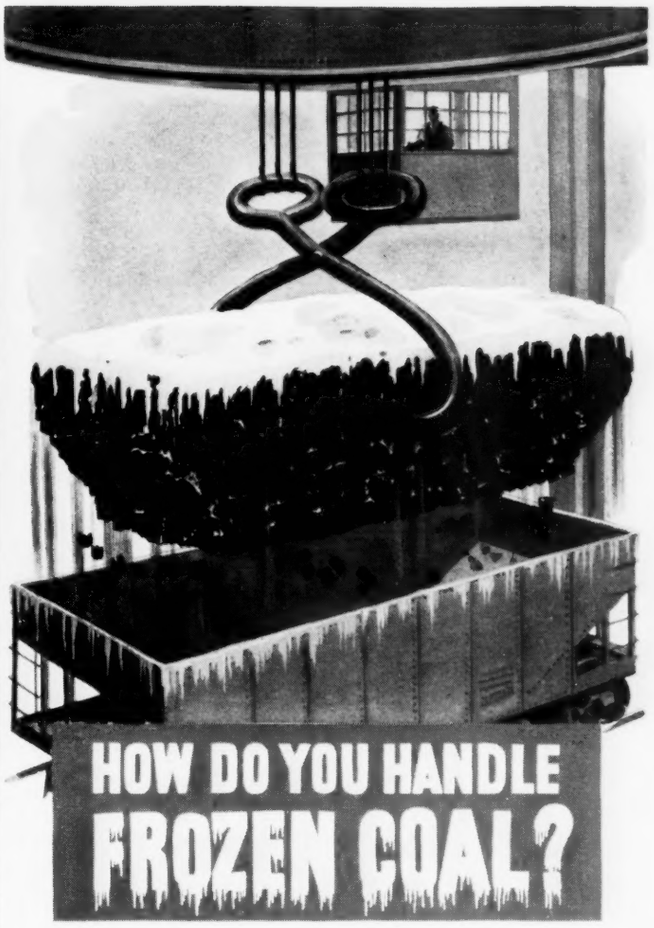
3. Impeller clearance is adjusted *while the pump is running*, insuring constant pump capacity so essential for uniform washing.

4. There are twenty-eight possible nozzle assembly combinations for each standard pump. Washery designers like this "adaptability feature" as it helps them out of tight places and simplifies piping.

5. We carry the spare parts stock. Order your replacements when needed. Reduce your inventory by using Goyne Process Pumps.

All inquiries receive prompt and careful attention.

THE GOYNE STEAM PUMP CO.
ASHLAND, PA.



YOU couldn't unload frozen coal with a huge pair of tongs as our absurd illustration suggests. Chances are it is frozen to the car.

What are you going to do?

The economical way is to prevent frozen coal by freezeproofing it at the mines with calcium chloride. If you meet the domestic demand for dustless coal you can dustproof with calcium chloride and get freezeproofing free at no extra cost.

Remember that frozen coal means frozen transportation — cars lying idle that ought to be carrying war goods. This year more than ever, freezeproofing with calcium chloride is essential to grade maintenance and quick unloading. Our bulletin No. 37 tells how. Write for it today.

CALCIUM CHLORIDE ASSOCIATION
4145 PENOBSCOT BLDG. • DETROIT, MICHIGAN

Send for
BULLETIN 37
on Dustproofing and
Freezeproofing Coal

CALCIUM CHLORIDE
FOR EFFECTIVE DUSTPROOFING AND FREEZEPROOFING

"Wartime Dewatering" is a job for DEMING PUMPS

Impact of war on coal mining demands continuous operations with minimum delays.

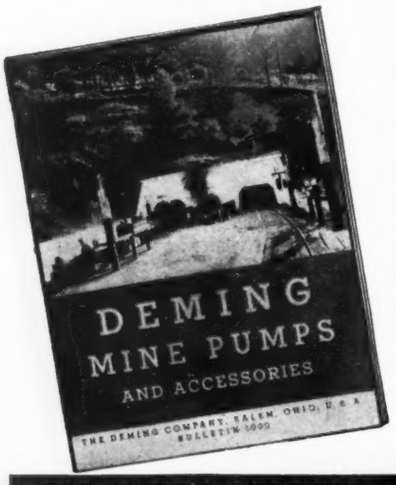
Pumping equipment for mine dewatering must be correctly matched to meet specific conditions.

Pumps must be capable of overcoming peak load demands.

Where acid water is an obstacle, pumps made to resist those conditions are vital to continuous performance.

Check up on YOUR pumping equipment NOW!

Call in a Deming representative for advice. "Wartime dewatering" is a job for Deming Pumps. There's a type and capacity for every need.



Write for Bulletin 1000 which contains important information about Deming Mine Pumps and Accessories. If the name of the nearest Deming representative is unknown to you, tell us and we will give you his location.

THE DEMING COMPANY · SALEM, OHIO

The greatest help a coal mining man can have—

IF YOU want to make sure of getting your certificate of competency—sure of winning a bigger job with bigger pay, get Beard's great books today and put them to work for you.

In these three books you have a practical, always-on-the-job guide that will help you solve the problems you face every day, show you what to do, tell you why it should be done.

Board's Mine Examination Questions and Answers!

3 volumes — $7.50, payable in four monthly payments

THESE books explain what a man must know in order to become a mine inspector, a mine foreman, assistant foreman, fireboss, hoisting engineer, safety engineer, shot-firer, etc.

They give you complete and authoritative information about air and gases, explosives, safety requirements and methods, mechanics, engines, hoisting, drainage, pumping, ventilation, timbering, instruments, and every other detail that the practical mining man must know.

Can you answer these questions—

What is meant by splitting the air current and what are the advantages derived from such methods?

Can a miner live in air in which the oxygen content is reduced to 17 per cent?

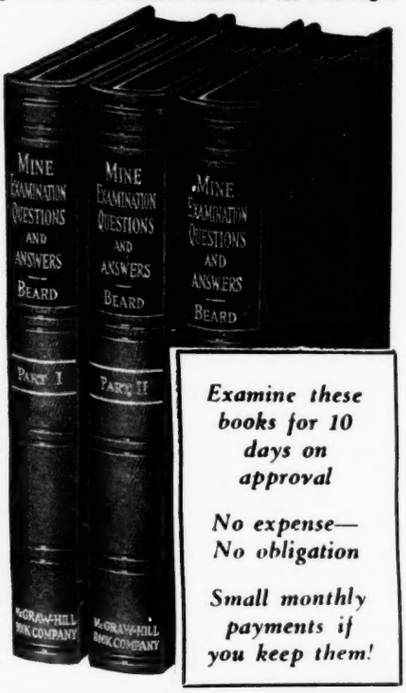
Name five duties imposed on mine foremen by law?

In what time can an engine of 40 effective hp. pump 4,000 cu. ft. of water from a shaft 360 feet deep?

What are the advantages and disadvantages of a gasoline pump, an air pump and an electrical pump?

What is the estimated tonnage per acre, per foot of thickness, for bituminous coal?

These are but a few of the more than 2000 questions given in Beard's books together with full correct answers. Hundreds of men have used this method to prepare for higher, better jobs. You can too, if you have the Beard books and plan to use them systematically. They are the best investment that a mining man can make—not only as an aid for passing examinations but as practical reference volumes on everyday mining operation problems.



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PAYS OFF DOLLARS IN EXTRA SERVICE AND ADDED PRODUCTION

Borod consists of small particles of cast tungsten carbide—the hardest known commercial metal —sealed in mild steel tubes. The rods are easily applied with a standard oxy-acetylene outfit and are especially recommended for hard-facing coal cutter bits. Because Borod is so hard and so much more wear resistant than even the best grade of heat treated steel, bits tipped with this alloy outlast unprotected bits as much as eight times. The use of Borod therefore eliminates frequent bit dressings, reduces bit handling to a minimum, increases coal production and saves precious man-hours.

Borod costs $5.50 per pound f.o.b., Whittier, California, but one ounce will cover the points of 200 bits and a top notch welder can hard-face up to 500 bits per hour. If you want more production from your cutting machines, try a pound or two of Borod today. A preference rating of A-10 or higher should be included on your order.

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STOODY COMPANY *Hard Facing Alloys*

THOROUGH LUBRICATION

is essential to

KEEP 'EM ROLLING

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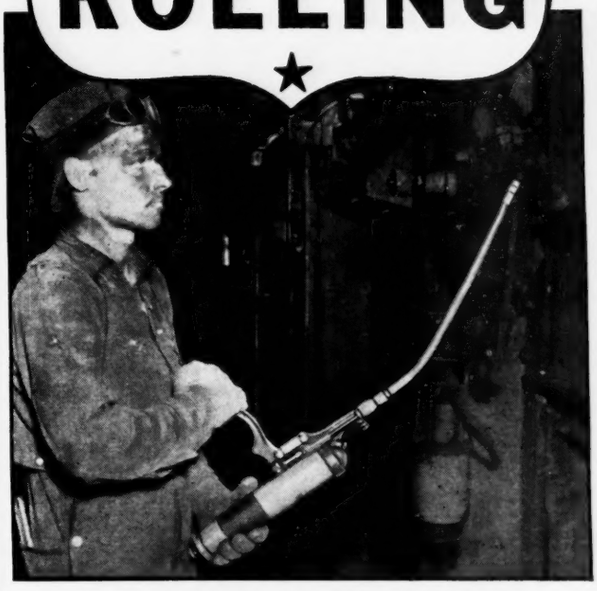

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are designed for fast, thorough, economical lubrication service

Regardless of whether you need a hand operated grease gun of the type shown above, or an automatic lubricating system for a complete machine or series of machines in your mine—it pays to specify LINCOLN.

As pioneer builders of lubricating equipment, and as one of the largest manufacturers in the field, Lincoln is well qualified to supply the correct lubricating equipment for your needs.

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ASK for LATEST BULLETINS

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- - BUY U. S. WAR BONDS and STAMPS - -

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PIONEER BUILDERS OF LUBRICATING EQUIPMENT
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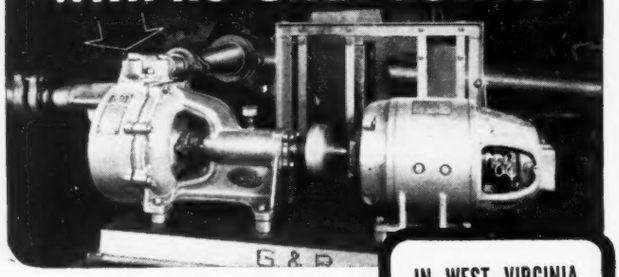
it PUMPS 24 hours a day with no "shut downs"



The keynote of the dependable G & R Mine Gathering Pumps is the word "simplicity". Because of greater simplicity (only one moving part — the impeller), these Self-Priming Centrifugals will pump more water, more continuous hours, per dollar invested than any other type. No valves to clog; no cylinder liners to be cut out; no gears, cams, levers, etc., to wear, break, or cause trouble. Pumps operate at motor speed. Capacities up to 220 GPM; heads up to 125 ft. Our engineering department will survey your requirements and make recommendations or write for Bulletin MP-2. It's free.

See our catalog data in Coal Mining Catalogs

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the Koppers Company are replacing old pumps as they wear out with G & R self-priming centrifugal mine gathering pumps. At the Helen, Stanaford, Kimball, Stotesbury and Kopperstown Mines 36 G & R Pumps of varying capacities are daily proving their simplicity and dependability.

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HENDRICK
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PERFORATED PLATE

Round—Square—Diagonal—Slot
Any perforation

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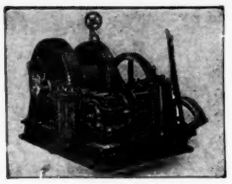

Manufacturers of Steam, Electric and Gasoline Hoists of all types; also parts for all model Flory Hoists.

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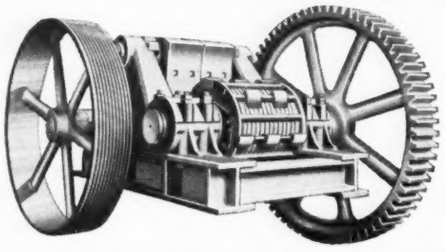
ALL-STEEL ROCKMASTER CRUSHERS



McLANAHAN BUILDS A TYPE AND SIZE FOR EVERY COAL CRUSHING REQUIREMENT! WRITE FOR DATA.

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ESTABLISHED 1835 — HOLLIDAYSBURG, PENNA.

PERFORATED METAL
COAL MINING SCREENS
Manufactured exactly to your specifications
Any size or style screen, in thickness of steel wanted with any size perforation desired.
We can promptly duplicate your present screens at lowest prices.

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MANUFACTURING CO. WELLSTON, OHIO
DESIGNERS AND BUILDERS OF COAL HANDLING EQUIPMENT FOR OVER 25 YEARS

Shaking Screens
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COMPLETE COAL TIPPLES AND COAL HANDLING EQUIPMENT
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10 cents a word, minimum charge $2.00. (See ¶ on Box Numbers.)
POSITIONS WANTED (full or part-time individual salaried employment only), ½ the above rates.
PROPOSALS, 50 cents a line an insertion.

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BOX NUMBERS in care of any of our New York, Chicago or San Francisco offices count 10 words additional in undisplayed ads.

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The advertising rate is $6.30 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page. C.A.

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EXPERIENCED ELECTRICIAN

For the care of Jeffrey & Goodman mining machines and motors.

Good house with furnace and bathroom, spring water, at the mine.

THE PLEASANT VALLEY MINING CO
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POSITION WANTED

ENGINEER — SUPERINTENDENT, Mining graduate desires position. 30 years experience as engineer, foreman, superintendent, safety, construction, mechanization and preparation. Southern Appalachian location preferred. PW-659, Coal Age, 330 W. 42nd St., New York, N. Y.

WORK WANTED

COAL LOADERS — large, experienced crew. Will work anywhere. Best references. Write: 646 Hegney Place, Bronx, New York.

BUSINESS OPPORTUNITIES

FOR LEASE, on tonnage, stripping coal, several hundred acres, all or part, Coal is high grade by product type, having analysis as follows: Moisture 1.5, Vol. 29.7, Car. 61.6, Ash 7.2, Sulphur 0.8, Phos. .008 Fusion 2900°F. Property has been completely tested. Location near Connellsville Region. Write BO-660, Coal Age, 330 W. 42nd St., New York, N. Y.

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Rail-River Coal Mines

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COAL MINES and Acreage, Fire-Clays and Iron-Ores for lease on royalty. Cornett-Properties, P.O. Box 235, Grayson, Kentucky.

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WANTED TO CONTRACT: Stripping of several hundred acres high-grade coal in Alabama, moderate overburden, easy stripping. Address CW-658, Coal Age, 520 N. Michigan Ave., Chicago, Ill.

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JOY LOADER, Bradford Breaker Outfit. Four 12 Cubic Yard Sidedump Railroad Cars, Two Skips or Cages, Hoisting Engines, Steel Headframe with Sheaves. FS-627, Coal Age, 520 N. Michigan Ave., Chicago, Ill.

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1—220 kva, 2300, 115/230 All. Ch. 3 ph.
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1—150 kva, 2200, 230/460 G.E. 3 ph.
1—100 kva, 2200, 110/220 G.E. 3 ph.
1—100 kva, 2200, 110/220 West.
3—100 kva, 6600, 550/440/220 Pgh.
1—100 kva, 2200, 220/110 West.
2—75 kva, 2200, 220 Burke 3 ph.
2—50 kva, 2300, 220/440 G.E. 1 ph.
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3—50 kva, 6600, 575 G.E.
1—50 kva, 2200, 220 Burke
3—50 kva, 2200, 110/220 West.

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Thomas, 3 HP ratio 100:1
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Kerr, 275 HP ratio 3800 rpm. to 720 rpm.

230 V. D.C. MOTORS

HP.	Make	Speed
125	G.E.	1750 rpm
100	West.	250
85	G.E.	530
75	West.	1700 rpm.
75	West.	475
75	Reliance	1750
50	West.	975 rpm.
50	West.	1700 rpm.

M. G. SETS—SYNCHRONOUS
200 kw, West. 600 v. DC 600 rpm, 220/3/60.
150 kw, West. 275 v. DC 600 rpm. 2300/3/60.
125 kw, Cr. Wh. 250 v. DC 1200 rpm. 220/440/3/60 Ind.
30 kw. West. 60 v. 1750 rpm. dir. con. 220/440/3/60 Ind.

A.C. GENERATOR—3 ph. 60 cy.
219 kva. G.E. 2200/440/220 v. 200 rpm.

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40 HP. Single drum AC 220/3/60.
100 HP. Lidgerwood 2 drum AC or DC Motor.

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4x3 Harris, 320 rpm.
4x4 Weinman, 500 gpm.
6x6 Gould, bronze, 1500 gpm.
8x8 Weinman, bronze.
5x6 Hayton, 750 gpm.
6x6 Manistee, 750 gpm.
6x6 American, 1000 gpm., bronze.
6x6 Weinman, 1000 gpm.

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50 kw. West. 220/3/60 Ames STEAM
75 kw. G.E. 220/3/60 Bessemer GAS.
75 kva. Allis Chal. 220/3/60 dir. con. 14x14 Steam Engine.
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SLIPRING MOTORS—3 ph. 60 cy.

No.	HP	Make	Type	Volts	Rpm.
1	15	Allis. Chal.	ANY	2200	485
1	700	G.E.	MT-432	2200	393
1	400	West.	CW	2200/550/2-0	435
1	400	West.	CW-967A	220–440	1170
1	300	G.E.	I-M	220–440	600
1	260	Burke	EMV-65	220–440	600
3	250	G.E.	I-M	550	600
3	250	G.E.	I-M	2200/220/440	600
3	200	G.E.	I-M	2200/220/440	600
1	200	G.E.	I-M	2200	514
1	200	West.	CW-956A	2200	690
1	150	G.E.	I-M	220/440	900
1	100	West.	CI	220/440	1750
1	75	West.	CI	220/440	860

SQUIRREL CAGE MOTORS—3 ph. 60 cy.

HP	Volts	Make	Type	Speed
500	2200/440/220	West.	CS	720
400	2200/440/220	West.	CS	500
450	2200/440/220	West.	CS	600
400	2200/440/220	West.	CS	600
350	2200/440/220	West.	CS	450
300	2200/440/220	West.	CS	400
200	2200/440/220	West.	CS	250
200	220/440	West.	CS	580
200	2200	West.	CS	870
150	550/220/440	G.E.	—	575
150	220/440	G.E.	KT-562	690
150	2200/440/220	Al. Ch.	Syn.	1200

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300 KW G.E. SYN. 575 V. HCC, 6 Ph., 60 Cy., 1200 RPM. form P, 2300/4000 V. Transformers.
200 KW AL-CH SYN. 275 V. 6 Ph., 60 Cy., 1200 RPM. Pedestal type, 2300/4000 V. Transformers.
150 KW G.E. SYN. 275 V. HCC, 6 Ph., 60 Cy., 1200 RPM. form P, 2300/4000 V. Transformers.

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200 KW G.E. SYN., 275 V., 2300/4000 V. 3 Ph., 60 Cy., 1200 RPM. 80% P.F. Manual Switchgear.
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200 KW G.E. IND., 600 V., 2300/4000 V., 3 Ph., 60 Cy., 1200 RPM. Manual Switchgear.
200 KW R.W. SYN., 275 V. 2300/4000 V., 3 Ph., 60 Cy., 900 RPM. 80% P.F. Manual Switchgear.

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8-T WESTGHE, 500 V., 906-C Mts., 36"-44" Ga.
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Prompt Shipment From Our Warehouse

MINING MACHINES

2—12 GE Goodman 220/3/60 AC 6′ Bar.
3—12 AB Goodman 250 V. DC 6′ Bar.
2—35 B Jeffrey 250 V. 6′ Bar (late type)

LOCOMOTIVES (Battery)

5 Ton Jeffrey storage battery 42 to 44″ Ga.
5 Ton Ironton type E 42″ Ga.
4 Ton Jeffrey 44″ Ga.

(Haulage)

12 Ton Jeffrey 250 V. 40″ Ga.
10 Ton Westgh. 250 V. 36″ Ga.
6 Ton G.E. 250 V. 36″ Ga.

MG SETS 3 ph. 60 cy. (Syn.)

150 KW West. 550 V. DC 2200 V. AC-1200 RPM
100 KW Cr. Wh. 250 V. DC—440/3/60/1200 RPM
100 KW G.E. 550 V. DC 2200/3/60 AC 900 RPM
90 KW Al.Ch. 250 V. 2200 V. AC 900 RPM

SYN. MOTORS 3 ph. 60 cy.

HP	Make	V.	Speed
350	Al.Ch.	2200	600
2/75	Westgh.	2200	900

SQUIRREL CAGE MOTORS 3 ph. 60 cy. (Wound Rotors)

HP	Make	V.	Speed
200 (5)	G.E.	2200	600
150 (4)	G.E.	2200	600
125 (1)	G.E.	2200	600

SLIP RING & SQ. CG. MOTORS (3 ph. 60 cy.)

HP	Make	Speed	Wdg.	Type
700	G.E.	393	S.R.	MT 432
400	West.	500	S.C.	CS
300	G.E.	600	S.R.	IM
200	Cr. Wh.	400	S.R.	28
200	Al. Ch.	600	S.C.	
150	G.E.	720	S.R.	IM
150	West.	580	S.C.	CCL
150	G.E.	600	S.R.	IM
125	Al. Ch.	435	S.R.	
100	G.E.	500	S.R.	MI-25 cy.
75	G.E.	865	S.C.	KT

HOISTS

75 HP Lidgerwood sgl. fr. drum
50 HP Diamond 2 drums same Shaft
30 HP Clyde sgl. drum AC Motor
15 HP Lidgerwood sgl. dr. AC Motor

400 TRANSFORMERS (Westgh. & GE 1 ph.)

Qu.	KVA	Prl. V.	Sec. V.
3	1	2080/2200	115/230
5	2	〃	〃
100	5	〃	〃
82	7½	〃	〃
71	10	〃	〃
1	30	〃	〃
3	37 Rotary	4400/185	〃
2	100	〃	〃
	3 Phase		
1	150	〃	230/460

ENGINE GENERATOR SETS

100 KW 250 v. DC Westgh.—Skinner Engine

D. C. MOTORS

1 to 125 HP, all speeds

MOORHEAD-REITMEYER CO., INC.

PITTSBURGH, PENNSYLVANIA

Immediate Shipment
Low Prices

NEW RUBBER

Guaranteed
High Grade

CONVEYOR and TRANSMISSION BELTING

CONVEYOR BELTING
ABRASIVE RESISTANT COVERS

Width	Ply	Top-Bottom	Covers
48″	8	1/4″	1/16″
42″	5	1/4″	1/16″
36″	6	1/4″	1/16″
30″	6	1/4″	1/16″
30″	5	1/4″	1/16″
24″	5	1/4″	1/32″
24″	4	1/4″	1/32″
20″	5	1/4″	1/32″
20″	4	1/4″	1/32″
18″	4	1/4″	1/32″
16″	4	1/4″	1/32″
14″	4	1/16″	1/32″
12″	4	1/16″	1/32″

TRANSMISSION BELTING
HEAVY-DUTY FRICTION SURFACE

Width	Ply	Width	Ply	Width	Ply
18″	6	10″	6	6″	5
16″	6	10″	5	5″	5
14″	6	8″	6	4″	5
12″	6	8″	5	4″	4
12″	5	6″	6	3″	4

ELEVATOR BELTING
HEAVY DUTY RUBBER COVERED

Width	Ply	Top-Bottom	Covers
12″	6	1/16″	1/16″
14″	6	1/16″	1/16″
16″	6	1/16″	1/16″
18″	6	1/16″	1/16″

ENDLESS "V" BELTS

"A" — WIDTH — All Sizes
"B" — WIDTH — All Sizes
"C" — WIDTH — All Sizes
"D" — WIDTH — All Sizes
"E" — WIDTH — All Sizes
Sold in Matched Sets

RUBBER HOSE

ALL SIZES FOR AIR — WATER — STEAM — SUCTION — FIRE — WELDING ETC.

Inquire For Prices :—: Mention Size and Lengths

CARLYLE RUBBER CO., Inc.

66 PARK PLACE New York, N. Y.

SUB STATIONS

1—300 KW G. E. Syn. M.G. Set, 3/60/2300-80% PF, 275 V DC.
1—35 KW 125 V Battery Charging Set.

MINE LOCOMOTIVES

1—6 ton G. E. with 250 V motors.
2—5 ton G. E. HM 825 motors with gathering reel.

CUTTING MACHINES

8—35B Jeffrey 250 V Shortwalls.
1—35BB Jeffrey AC Shortwall.
1—12G3 Goodman AC Shortwall.
2—12AB Goodman 210 V DC Shortwall.
1—29B Jeffrey Arcwall DC.
1—29C Jeffrey Arcwall DC.
1—29LE Jeffrey with turn over head AC Motors.
1—29LE Jeffrey with DC Motors.

MISCELLANEOUS

1—90L Goodman Elevating Conveyor.
1—Sullivan Bit Sharpener.
1—36″ x 36″ single roll coal crusher.

Tippins Machinery Company

3530 Forbes St. Pittsburgh, Pa.

★DISMANTLING MINE★

ONE MILE FROM LOGAN—*All 250 Volt, 44″ track gage*

GENERATORS

1—150-KW **Motor-Generator set**, 500 volt
1—150-KW **Steam plant**, 250 volt
1—100-KW **Ridgway Motor-Generator set**, 250 volt
1—90-KW **Westinghouse M-G** set 250 volt

LOCOMOTIVES, 250 VOLT

1—10-ton **Jeffrey** MH-78, 32″ high, 44″ Gage
1—8-ton **Westinghouse** 65, 42″ gage
1—6-ton **Westinghouse**, 904-C, 44″ gage
1—6-ton **G.E. 823**, 44″ gage

CUTTING MACHINES

1—124-EJ **Goodman slabbing machine**, 250 volt
1—CR-2 **Sullivan low vein shortwall**, 250 volt
2—CE-7 **Sullivan**, 7½′ bars, 250 volt
1—CE-7 **Sullivan**, 7½′ bar, 220 volt, A.C.
12—G3 and 212-G3, 220-440 volt, **Goodman A.C. motors**
Crusher 31½ x 36″ **Scotdale double roll**, complete with 60-HP. motor.
TIPPLE 1—**4-track Kanawha tipple** complete with all machinery, motors and magnetic starters just as released from service. A real buy if you need a good tipple.

A.C. & D.C. MOTORS AND MANY OTHER ITEMS IN STOCK.
LET US KNOW YOUR NEEDS—WE BUY, SELL AND TRADE.

ALL-STATE EQUIPMENT CO., Inc.

LOGAN, WEST VIRGINIA *Phone 884*

FOR SALE

20, 5BU Loading Machines

A. C. MOTORS

30 Units, 15 to 75 H.P. squirrel cage 3/60/440

D. C. MOTORS

15 Units, 3 H.P. to 60 H.P., 230 V.
40 KW, 110 V. D.C. Generator
200 KW, 600 V. Motor Generator Set synch. motor, 3/60/2200
1000 KW Turbine Type G.E. Generator 3/60/2300, 3600 RPM
500 KW G.E. Skinner Uniflow Steam Engine Generator, 250 V. D. C.
6½-yd. 320-B Bucyrus Stripping Shovel
¾-yd. P. & H. Crawler Crane, 38′ boom

IRON & STEEL PRODUCTS, INC.

37 years' experience
13484 S. Brainard Ave., Chicago, Illinois
"*Anything* containing IRON or STEEL"

Ten—5 BU JOY LOADERS

caterpillar type
250 volts D. C.

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"*Anything* containing IRON or STEEL"

NEW and REBUILT
STORAGE BATTERY

LOCOMOTIVES

1½ to 10 Ton — 18″ to 56″ Track Gauge
GREENSBURG MACHINE CO.
Greensburg, Penna.

MINE HOISTS and HOIST MOTORS

Jones Mining Equipment Co.

541 Wood Street Pittsburgh, Pa.

COAL AGE ADVERTISERS IN THIS ISSUE

An asterisk preceding manufacturer's name indicates detailed information may be found in the 1942 *COAL MINING CATALOGS*. Where † appears after a company's name the advertisement does not appear in this issue, but was in preceding issues.

*Ahlberg Bearing Co..... †
Air Reduction Sales Co..... †
Allis Co., The Louis
Insert between pp. 32–35
*Allis-Chalmers Mfg. Co..... †
*American Bratticle Cloth Corp. ..... †
*American Cable Div. of American Chain & Cable Co.
Third Cover
American Car & Foundry Co.
Insert between pp. 21–24
American Colloid Co..... 134
American Cyanamid & Chemical Corp..... †
*American Mine Door Co..... 90
American Optical Co..... 93
*American Pulverizer Co..... 28
*American Steel & Wire Co.. 37
Anaconda Wire & Cable Co.. 45
Atlas Powder Co..... 18

*Barber-Greene Co.....50b, 50c
Bemis Bro. Bag Co..... †
*Bethlehem Steel Co.....26, 27, 49
Bituminous Casualty Corp... 92
*Bowdil Co..... 50d
Broderick & Bascom Rope Co. †
*Brown-Fayro Co..... 79

Calcium Chloride Ass'n..... 149
Cardox Corp..... 91
*Carnegie-Illinois Steel Corp 37
*Central Mine Equipment Co. 81
*Centrifugal & Mechanical Industries, Inc..... 105
Chicago Perforating Co..... 152
*Chicago Pneumatic Tool Co.. †
*Cincinnati Mine Machinery Co. ..... †
Cities Service Oil Co..... 38
Clarkson Mfg. Co..... †
Coal Mining Catalogs..... 110
Coffing Hoist Co..... †
Columbia Steel Co..... 37

*Deister Concentrator Co..... 130
*Deister Machine Co..... †
DeLaval Steam Turbine Co.. 141
*Deming Co..... 150
Differential Steel Car Co.... 75
Dings Magnetic Separator Co. 139
Dow Chemical Co..... 148
*Duff-Norton Mfg. Co..... 116
*duPont de Nemours & Co., Inc. E. I. (Fabrikoid Div.) 120
duPont de Nemours & Co., Inc. E. I. (Explosives Div.) 83
duPont de Nemours & Co., Inc. E. I. (Grasselli Chemicals Dept.)..... 133

Edison Storage Battery Div. of Thos. A. Edison, Inc.... 36
*Electric Storage Battery Co. 101
Elliott Service Co..... 87
Ensign-Bickford Co..... 54
*Enterprise Wheel & Car Corp. †

Fairbanks Co., The..... †
*Fairmont Machinery Co..... 48
Flexible Steel Lacing Co.... †
*Flocker & Co., John..... 90
Flory Mfg. Co..... 152

Gates Rubber Co..... 40
General Cable Co..... †
*General Electric Co.....31, 51
General Electric Co. (Appliance and Merchandising Dept.) ..... †
Goodman Mfg. Co.....19, 39
Goodrich Co., B. F..... 1
Goodyear Tire & Rubber Co. †
*Gorman-Rupp Co..... 152
Gould Storage Battery Corp.. 32
*Goyne Steam Pump Co..... 149

Hardsocg Mfg. Co..... 115
Harnischfeger Corp..... 119
*Hazard Insulated Wire Works 8
*Hazard Wire Rope Div. American Chain & Cable Co.... †
Hendrick Mfg. Co..... 152
Hercules Powder Co..... 94
Holmes & Bros., Robt..... †
Hulburt Oil & Grease Co ..2, 3

I. T. E. Circuit Breaker Co.. 46

*Jeffrey Mfg. Co.....
Insert between pp. 8–13
Johnson-March Corp., The... 126
*Jones & Laughlin Steel Corp. †
*Joy Mfg. Co.....52, 53

King Powder Co..... 103
Koehler Mfg. Co..... 82

*Laughlin Co., Thomas..... 122
*Leschen & Sons Rope Co., A. 108
Lima Locomotive Works, Inc. †
Lincoln Engineering Co..... 151
*Link-Belt Co.....Fourth Cover

Mack Trucks, Inc..... 125
Macmillan Petroleum Corp... †
Macwhyte Co..... 123
Marlo Co..... 147
McGraw-Hill Book Co..... 150
McLanahan & Stone Corp.... 152
McNally-Pittsburg Mfg. Co. 16–17, 118
*Merrick Scale Mfg. Co..... 124
*Metal & Thermit Corp..... 137
*Mine Safety Appliances Co.. 76
*Mining Safety Device Co.... †
Morrow Mfg. Co..... 152
Mosebach Electric & Supply Co. 141
*Myers-Whaley Co..... 29

*National Malleable & Steel Castings Co..... 85
*Norma - Hoffmann Bearings Corp. 24

Ohio Brass Co..... 25
Osmose Wood Preserving Co. of America, Inc..... †

Page Engrg. Co..... †
*Pennsylvania Crusher Co.... 140
Philco Storage Battery Div.. 4
*Pittsburgh Knife & Forge Co. 140
*Pomona Pump Co..... †
Portable Lamp & Equipment Co. ..... †
Post-Glover Electric Co..... 20
*Pressed Steel Car Co., Inc.. 118
Provident Life & Accident Insurance Co..... †

Roberts & Shaefer Co..... 148
*Robins Conveying Belt Co.. †
*Rockbestos Products Corp.... 50
*Roebling's Sons Co., John A. 6, 106
Rollway Bearing Co., Inc.... †
*Ruberoid Co..... †

*Salem Tool Co..... 130
*Sanford-Day Iron Works Co. 30
*Schramm Mfg. Co..... 127
Scully Steel Products Co.... 37
Searchlight Section.....153–157
Sinclair Refining Co..... 21
S K F Industries, Inc..... 42
Socony-Vacuum Oil Co..... †
Sprout-Waldron & Co..... †
Standard Oil Co. (Indiana). 35
Stearns-Magnetic Mfg. Co... †
Stoody Co..... 151
*Sullivan Machinery Co..... †
Sun Oil Co.....Second Cover

Templeton-Kenly & Co..... 148
Texas Co.....14–15
Thermoid Rubber Div. of Thermoid Co..... 47
Thornton Tandem Co..... 124
Tidewater Associated Oil Co. †
Timber Engineering Co..... 132
*Timken Roller Bearing Co.. 41

United Engineers, Inc 107
U. S. Rubber Corp..... 50A
*U. S. Steel Subsidiaries..... 37

Walter Motor Truck Co..... 117
West Disinfecting Co..... 89
Westinghouse Air Brake Co., Ind. Div..... 44
*Westinghouse Electric & Mfg. Co. 43
*West Virginia Rail Co..... 85
*Wickwire Spencer Steel Co.. 121
Wilmot Engineering Co..... 147
Wood Shovel & Tool Co.... †
*Wyckoff & Son Co., A..... 158

PROFESSIONAL SERVICES 146

■

SEARCHLIGHT SECTION

(Classified Advertising)

BUSINESS OPPORTUNITIES 153
CORE DRILLING 153
Hoffman Bros. Drilling Co..... 153
Pennsylvania Drilling Co..... 153
EMPLOYMENT 153
USED AND SURPLUS EQUIPMENT 153-157
All State Equipment Co., Inc..... 157
Benney Equipment Co., R. H..... 156
Bradford Supply Co., Inc..... 154
Carlyle Rubber Co., Inc..... 157
Cincinnati Machinery & Supply Co. 155
Coal Mine Equipment Sales Co... 154
Duquesne Electric Mfg. Co..... 155
Electric Equipment Co..... 155
Electric Service Co., Inc..... 153
Erman Howell & Co., Inc..... 154
Foster Co., L. B..... 154, 155
Frank, M. K..... 155
Greensburg Machine Co..... 157
Greenspon's Son Pipe Corp., Jos. 154
Guyan Machinery Co..... 156
Hair Equipment Co..... 155
Industrial Equipment Corp..... 155
Iron & Steel Products, Inc. 155, 156, 157
Ironton Products Co..... 154
Jones Mining Equipment Co..... 157
Kirk Co., Inc., Wallace E..... 155
Lewis-Chambers Constr. Co., Inc... 153
Moorhead Reitmeyer Co..... 157
Pennsylvania Crusher Co..... 156
Philadelphia Transformer Co..... 154
Sherwood, E. C..... 155
Stanhope, Russell..... 153
Teuscher Pulley & Belting Co..... 156
Tidewater Equipt. & Mach. Corp... 154
Tippins Machinery Co..... 157
Utility Elevator Service..... 153

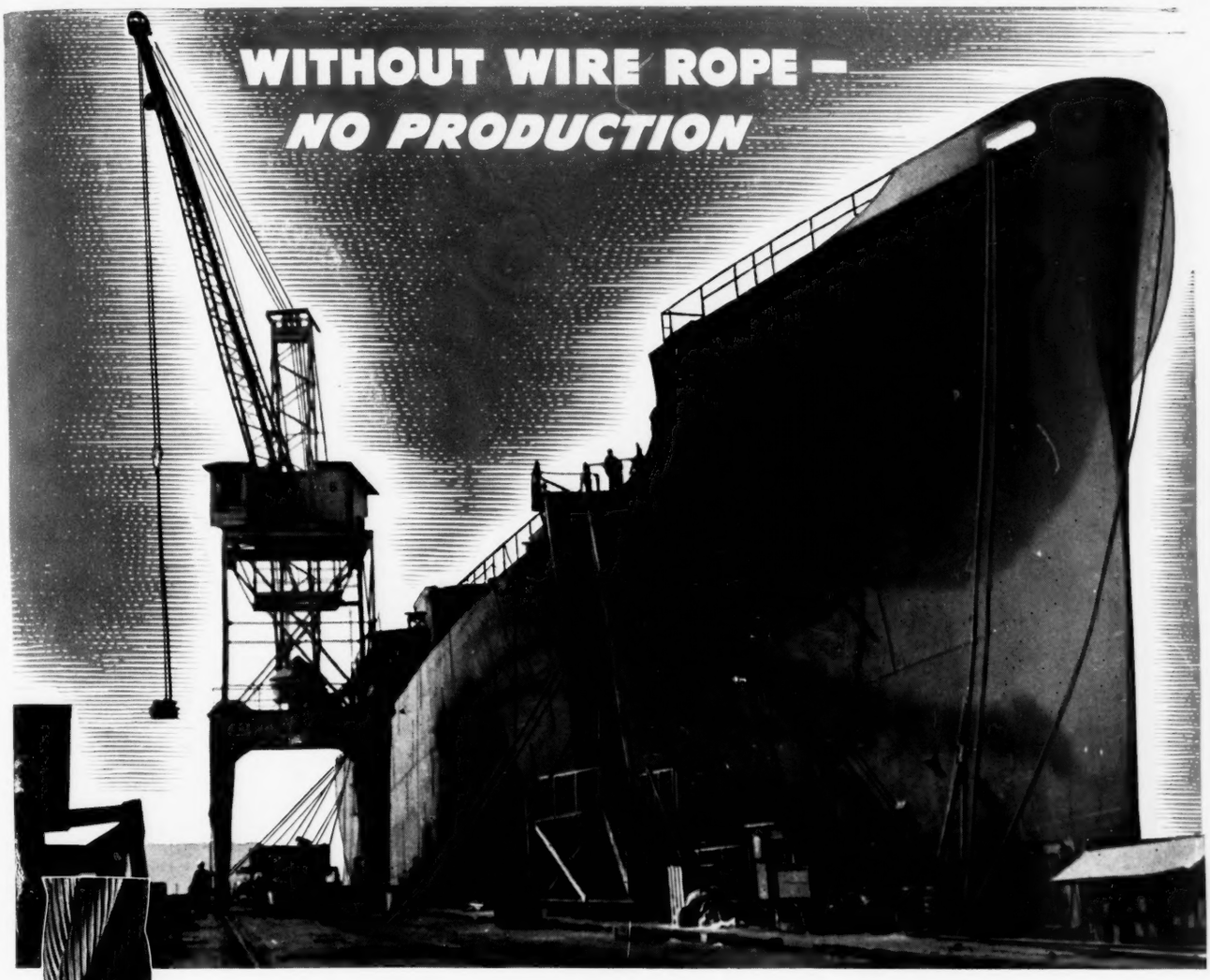
WOOD PIPE for Mine Drainage

Wyckoff Wood Pipe has an 87 year record of perfect resistance to the corrosive action of sulphurous mine water. It is an ideal, long-time investment—light, easy to lay, and relatively low in first cost

We also manufacture a special Hard Maple Pipe for flushing culm in the Anthracite Region and wood covering for underground steam lines.

Established 1855

A. WYCKOFF & SON CO.
Office and Factory
No. 35 Home Street, Elmira, N. Y.
The Originators of Machine Made Wood Pipe



WITH TRU-LAY *Preformed* WIRE ROPE—

MORE PRODUCTION

Your machines will operate with fewer interruptions for wire rope replacement if they are equipped with American Cable TRU-LAY PREFORMED. That means steadier production; time and money saved; steel conserved. . . . Regardless of application, American Cable TRU-LAY PREFORMED WIRE ROPE invariably lasts longer than ordinary non-preformed rope. It gives you greater dollar value in increased service alone. But TRU-LAY does much more than this. It handles much easier, faster, *safer.* It is a flexible, tractable, willing-to-work rope—not the kinky, unruly kind that fights the men who are working with it. It spools on the drum better; runs true and straight over sheaves; requires no seizing when cut. . . . Aid production—conserve steel—save money by using American Cable TRU-LAY PREFORMED WIRE ROPE.

AMERICAN CABLE DIVISION

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Tacoma

AMERICAN CHAIN & CABLE COMPANY, Inc.

BRIDGEPORT • CONNECTICUT

ESSENTIAL PRODUCTS . . . AMERICAN CABLE Wire Rope, TRU-STOP Emergency Brakes, TRU-LAY Control Cables, AMERICAN Chain, WEED Tire Chains, ACCO Malleable Iron Castings, CAMPBELL Cutting Machines, FORD Hoists and Trolleys, HAZARD Wire Rope, Yacht Rigging, Aircraft Control Cables, MANLEY Auto Service Equipment, OWEN Springs, PAGE Fence, Shaped Wire, Welding Wire, READING-PRATT & CADY Valves, READING Electric Steel Castings, WRIGHT Hoists, Cranes, Presses . . . *In Business for Your Safety*

"PRAISE THE LORD and (WE'LL) PASS THE AMMUNITION"

The PRODUCTIONEER*

Answers the Call of Freedom!

★ The War isn't going to be won on the *production* line—it's going to be won on the *firing* line. Yet it cannot be won without the gigantic effort of American Productioneers—without the constantly-increasing flow of materiel, ammunition, and fighting equipment produced by American Industry.

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★ Yes, American Productioneers are on the job day and night—passing the "ammunition" to the boys at the front, who know how to make the most of it!

*You are welcome to use the word "Productioneer" as applied to the war-worker in your mine, mill, shop or factory, if you so desire.

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LINK-BELT COMPANY

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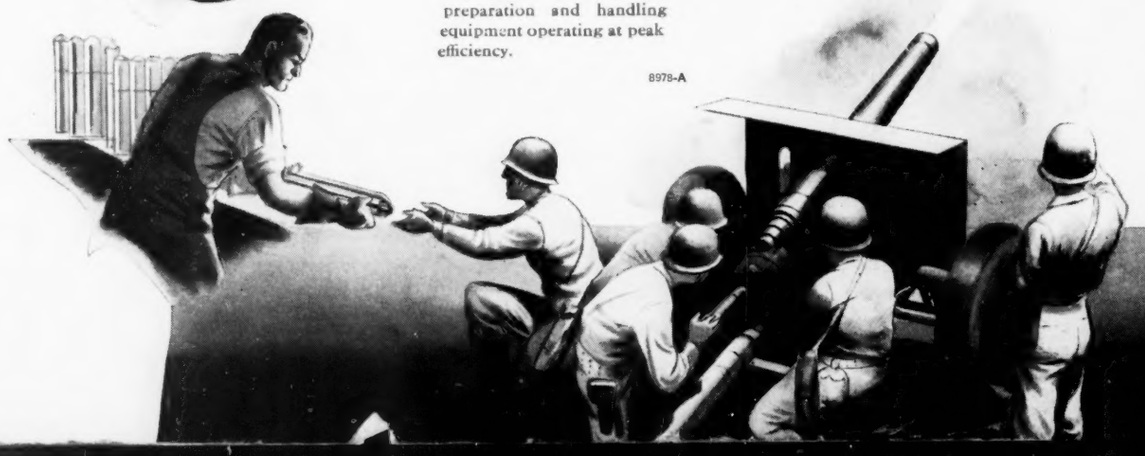
Link-Belt Maintenance Parts Service is available to keep your preparation and handling equipment operating at peak efficiency.

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